



Faculty of Science
Chemistry Department



June 26, 2024
Time: 3 hours

2nd Semester Final Exam for the Professional Diploma in Quality Control Students
Chem-514 Advanced Experimental Design

Answer the following questions:

(50 Marks)

I- What are the general guidelines for designing an experiment?

(4 Marks)

II- Define each of the following: experimental design, factorial design, response variable, randomization.

(4 Marks)

III- What are the five key steps in designing an experiment?

(4 Marks)

IV- Write (T) for True Sentences or (F) for False Sentences for the following statements:

(13 Marks)

1. In experimental design, the main effect is the difference between the factor average and the grand mean. ()
2. The experimental goals are considered to be short-term outcomes. ()
3. The impact of the sample size is not critical on the estimate of the difference in the two means. ()
4. Repetition and Replication can't provide an estimate of the experimental error. ()
5. A random variable may be discrete or continuous. ()
6. Strategic planning can replace good leadership and judgment. ()
7. One-shot response surface method (RSM) creates a relatively accurate prediction model and significance information, permitting identifying of interaction effects. ()
8. In fractional factorial design, the number of experiments can be reduced to $1/6^{th}$ of the total number of experiments. ()
9. On testing the hypothesis of the experiment reject the hypothesis for all random samples. ()
10. In most experiments, it is needed to compare two sets of results versus the baseline. ()
11. One of the advantages of randomization is to average out the effects of noise that may be present in the experimental results. ()
12. It is often critical when designing the experiments is to identify how multiple factors interact in affecting the results. ()
13. The goals of the experiments are easy to be measurable. ()

(25 Marks)

II- Choose the correct answers:

1. How many runs does a full factorial 4 factors 3 levels experiment consist of?

- a) 16
- b) 124
- c) 64
- d) 81

2. The experiment objectives are based on which are most influential on the response.

- a) Outputs
- b) Variables
- c) Both a, b
- d) None of the previous

3. The experiment is planned to evaluate the critically and logically.

- a) Outcomes
- b) Variables
- c) Both a, b
- d) None of the previous

34. There are several PAGE methods (SDS-PAGE, isoelectric focusing, 2D PAGE) that can be applied mostly for the separation of proteins based on distinct molecular properties.
35. In hybridization, the decreasing of the temperature allows the hydrogen bonds to reform and thus the complementary strands to hybridize.
36. RT-PCR is a technique for obtaining small amounts of a specific DNA sequence from a DNA sample.
37. Two compounds are dominantly used for gel electrophoresis: polyacrylamide and agarose.
38. The polymerase chain reaction is carried out in a reaction mixture which comprises the DNA extract (template DNA), Taq polymerase, the primers, and the four deoxyribonucleoside triphosphates (dNTPs) in excess in a buffer solution.
39. PAGE is the least popular cost-effective method to estimate the molecular mass of protein subunits with considerable accuracy.
40. To achieve selective amplification of nucleotide sequences from a DNA extract by PCR, it is essential to have at least one pair of oligonucleotides which will serve as primers for replication.
41. Elongation is carried out at a temperature of 72°C which is called elongation temperature and is the synthesis of the complementary strand.
42. The polyacrylamide gel possesses all advantageous properties necessary for a good electrophoresis medium, it is hydrophilic, free of electric charges and chemically stable.
43. PCR principle is based on the use of DNA polymerase which is an in vitro replication of specific DNA sequences.
44. The amount of the bound SDS molecules is largely independent of the amino acid sequence of the polypeptide chain and it is roughly a linear function of polypeptide length, molecular mass of the protein.
45. PCR technique is now essential in cellular and molecular biology.
46. RT-PCR allows the sensitive, specific and reproducible quantification of mRNA.
47. Real-time PCR technology is only as reliable as the accompanying controls and associated quality assurance programs.
48. Polyacrylamide electrophoresis separates macromolecular ions based on a combination of charge, size and shape.
49. Real-time quantitative PCR is the reliable detection and measurement of products generated during each cycle of the PCR process, which are directly proportional to the amount of template prior to the start of the PCR process.
50. The function of the tracking dye is to visualize the running front and, in turn, the completeness of the run. The most popular tracking dye is bromophenol blue.

Question ended

Good Luck

Answer the following:

(One question in two pages)

(50 marks)

In the Table, Tick (✓) for the right sentence or (x) for the false one:

1. Horse Radish Peroxidase (HRP) is glycoprotein with four lysine residues.
2. Substrate is oxidized by Horse Radish Peroxidase to produce a blue color.
3. All antibodies are proteins.
4. Elisaspot has been widely used to assess the cytokine release of various types of cells with or without stimuli.
5. Enzyme protects against the effects of the antigen either by lysis or immobilization of the particle.
6. Chymotrypsin is the enzyme used in the technique of ELISA.
7. The role of Horse Radish Peroxidase (HRP) in ELISA is Substrate.
8. The appearance of color in negative control may indicate cross-reactivity of secondary antibody with components in the antigen sample.
9. Antibodies always originate within the body.
10. ELISA allows for rapid screening and quantification of the presence of antigen in a sample.
11. Coating means incubating a plate with antigen or antibody.
12. Paratopes are variable regions of an antibody that binds to an epitope.
13. Your patient is a 39-year-old male. 11 g/dL is considered a normal Hemoglobin level for this patient.
14. A patient's platelet count is 300,000. You would interpret this result as "Abnormal: thrombocytosis".
15. Antigen is a substance that called immunoglobulins.
16. Eosinophils play a role in allergic disorders and in combating parasitic infections.
17. Lab result "Platelets 80,000" on a patient's record from the complete blood count (CBC) represents thrombocytopenia.
18. Hemoglobin reflects the protein found on the red blood cell that helps carry oxygen throughout the body.
19. MCH (Mean Corpuscular Hemoglobin) represents the average size of red blood cells on the CBC result.
20. A patient's complete blood count (CBC) results are back, "RBC 2.5 million" this result demonstrates polycythemia.
21. Neutrophils is a type of red blood cell.
22. Fever is a symptom of not having enough red blood cells or hemoglobin (a condition called anemia).
23. Thrombocytopenia is the name of the condition that results when a person does not have enough platelets.
24. Platelets help stop bleeding by initiating clots.
25. Hematocrit is the portion of red blood cells compared with total blood volume.
26. The pore size of polyacrylamide gels can be adjusted via the concentration of the acrylamide monomer and the ratio of the crosslinking agent, N,N'-methylenebisacrylamide.
27. Electrophoresis is a method used to separate charged particles from one another based on differences in their migration speed.
28. SDS-PAGE separates proteins based primarily on molecular weight, while isoelectric focusing separates proteins exclusively based on isoelectric point.
29. PCR is widely used for diagnostic purposes to detect the presence of a specific DNA sequence of this or that organism in a biological fluid and used to make genetic fingerprints.
30. Polyacrylamide gels can be used for the separation and analysis of proteins and relatively small nucleic acid molecules.
31. As charged particles can migrate between the two separate buffer chambers due to the electric potential difference, positive ions move towards the negatively charged cathode while negatively charged ions move towards the positively charged anode.
32. PCR is broken down into three phases, a denaturation phase, a hybridization phase with primers, and an elongation phase.
33. The denaturation is the separation of the two strands of DNA, obtained by raising the temperature.



Faculty of Science
Chemistry Department



Time: 2 hour
June 2023

C- 506 Practical Biochemistry II
Final Exam for Professional Diploma in Biochemistry Students

In the following table, Tick (✓) for the right sentence or (x) for the false one:

(50 marks)

1.		26.	
2.		27.	
3.		28.	
4.		29.	
5.		30.	
6.		31.	
7.		32.	
8.		33.	
9.		34.	
10.		35.	
11.		36.	
12.		37.	
13.		38.	
14.		39.	
15.		40.	
16.		41.	
17.		42.	
18.		43.	
19.		44.	
20.		45.	
21.		46.	
22.		47.	
23.		48.	
24.		49.	
25.		50.	

in the horizontal mode, agarose gels can be made from as little as 0.2% agarose, allowing molecular weights of to be determined.

- j) The SDS-PAGE can determine protein molecular weights to within 5% accuracy over the range.
- k) Centrifugation methods are based on in order to that would otherwise occur over Overcoming back-diffusion forces of small molecules that would not precipitate in the terrestrial gravitational field.
- l) The sedimentation rate is the result of two forces, that move the particle and the frictional or drag force,
- m) The sedimentation rate of a particle is proportional to and to the and if this difference is zero, the sedimentation rate becomes
- n) The velocity in the centrifuge is usually expressed in
- o) Centrifugal conditions are chosen according to and
- p) There are four basic types of rotors and which
- q) It is possible to classify centrifugation techniques as (when the main goal is to obtain a purified material) and (for characterization of purified samples).
- r) Once the centrifugation is finished, there are two principal ways to collect fractions or by
- s) HCV PCR test is performed to determine and antiviral therapy. The real time PCR technology utilizes for Probe Capture technology during, while is used for detection of HCV RNA.
- t) SARS CoV-2 is containing associated with a within a comprised of A typical CoV contains at least in its genome. All the structural and accessory proteins are translated from the

Good Luck

Examiner: Prof. Dr. Nagwa Abo El-Maali



Faculty of Science
Chemistry Department



Assiut University
Time: 2 hours

C 502 Bioanalytical Chemistry final Exam for Professional Biochemistry Diploma Students

Answer the Following Questions: (50 Marks)

- 1) Discuss how you can isolate lipoproteins from human plasma using centrifugation methods. (8 marks)
- 2) Write- in brief- the principles of real time PCR the quantitation of SARS CoV-2 that causes coronavirus disease 2019 (COVID-19). (7 marks)
- 3) Mention the causes of erroneous RCR results. (5 marks)
- 4) **Complete the following:** (30 marks)
 - a) The objective of many bioassay methods is to , or
 - b) Coronaviruses are a large family of viruses that can cause diseases in humans, ranging from to 2019-nCoV is a positive-sense, single-stranded
 - c) Colorimetric and fluorometric methods are for the quantitation of total protein, DNA, RNA, Carbohydrate, and free fatty acid all of the methods are based on or
 - d) The three assays for total protein are the , and methods. They are based on
 - e) The only method used to quantitate ribonucleic acid is the with this method, RNA is
 - f) Sensitive fluorometric assays for double-stranded (native) DNA in tissue extracts are based on the non-covalent interaction of intercalating dyes such as
 - g) Methods for the quantitation of free fatty acids involve followed by A colorimetric method is available for the quantitation of long- chain ($C > 10$) free fatty acids in plasma, It is based on
 - h) Because of the large pores in agarose gels, their major area of application is
 - i) In the vertical mode, agarose concentrations as low as 0.8% can be made, allowing the separation of proteins and nucleic acids up to molecular weights of while



(10 marks for the question)

Answer the following questions:

If the survival times are normally distributed, compute 95% confidence interval for the mean survival times and test the hypothesis that $H_0: \mu = 12.5$; $H_1: \mu < 12.5$ at $\alpha = 0.05$

5) A researcher wishes to try three different techniques to lower the blood pressure of individuals diagnosed with high blood pressure. The subjects are randomly assigned to three groups A, B and C. After four weeks, the reduction in each person's blood pressure is recorded and the data are shown. At $\alpha = 0.05$, test the claim that there is no difference among the means.

A	13	12	9	15	10
B	6	0	3	8	2
C	8	9	12	5	4

Tabulated values:

$$\Phi(0.22) = 0.5871, \Phi(1.42) = 0.9222, \Phi(0.27) = 0.6064,$$

$$\Phi(2.5) = 0.9938, t(0.975, 9) = 2.2622, t(0.95, 9) = 1.8331,$$

$$t(0.995, 7) = 3.4995, t(0.975, 7) = 2.3646, F(0.95, 2, 12) = 3.89$$

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Good luck, Zeinhum Jaheen

93	84	90	88	83	78	92	87	Twin A
88	80	93	86	83	79	92	83	Twin B

**Answer the following questions:****(10 marks for the question)**

1) The average numbers of pounds of meat that a person consumes per year is 218.4 pounds. Assume that the distribution is approximately normal with standard deviation 25 pounds:

- (i) Find the probability that a person selected at random consumes less than 224 pounds per year.
- (ii) For a sample of 40 persons, compute the probability that the mean of the sample will be less than 224 pounds per year.

2) If 53% of the population have at least some college education. Choose 20 persons at random, find the probability that:

- (i) Fewer than 10 have some college education.
- (ii) At least 5 do not have any college education.

3) A researcher wanted to compare the pulse rates of identical twins to see whether there was any difference. Eight sets of twins were selected. The rates are given in the table as number of beats per minute. At $\alpha = 0.01$, is there a significant difference in the average pulse rates of twins and find the 95% confidence interval for the difference of the two.

Twin A	87	92	78	83	88	90	84	93
Twin B	83	95	79	83	86	93	80	86

4) The mean time for mice to die when injected with 1000 leukemia cells is known to be 12.5 days. When the injection was doubled in a sample of 10 mice, the survival times were

10.5, 11.2, 12.9, 12.7, 10.3, 10.4, 10.9, 11.3, 10.6, 11.7

b) Distinguish between software faults and software failure.

5-a)- Explain in detail the reliability of the K-out-of-n System

b) Suppose that the lifetime of the component T is exponential distributed with unknown failure rate with pdf $f(t) = \lambda e^{-\lambda t}, t > 0$, and we have recorded lifetimes (in hours) for a total of 10 out of 15 items (type-2 censored sample) of the form: 5.6, 6.1, 4.9, 7, 7.2, 6.8, 6.7, 5.9, 7.2, 8,

(i)- estimate λ , (ii) compute 95% confidence interval for λ ,

$$\chi^2(0.025,9) = 2.7, \chi^2(0.975,9) = 19.023$$

With my best wishes

Professor Zeinhum Jaheen



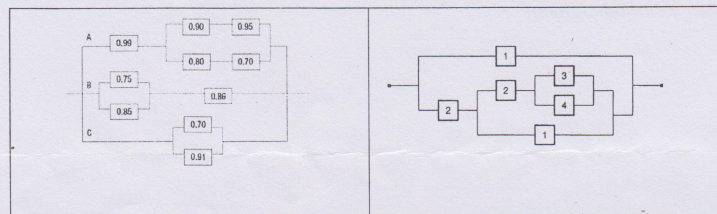
Answer the following questions:

1-a)- Explain in detail the following:

Reliability model, IFR, MRL and Bathtub failure rate.

b) If T is a random variable with pdf $f(t) = e^{-t}, t > 0$,
calculate the FRF and MTTF .

2)- Compute the reliability R_s for the following reliability block diagrams:



3-a)- Draw and explain Bathtub curve of the failure rate function.

b) A component with time to failure T has failure rate function

$$h(t) = 3t^2, t > 0,$$

compute the reliability function for the time to failure and compute $R(10)$.

4-a)- Consider a system that has seven components and the system will work if any five of the seven components work (5-out-of-7 system). Each component has a reliability of 0.92 for a given period. Compute the reliability of the system.

8- Mention 2 differences between Hemolytic jaundice and obstructive jaundice. (2 marks)

	Hemolytic Jaundice	Hepatic Jaundice
Type of bilirubin raised		
Appearance of bilirubin in urine		

9- Mention 2 indications for parathyroid testing. (2 marks)

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10- Mention 3 causes of hypocalcemia & 2 causes of hypercalcemia. (2.5 marks)

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11- Mention 4 causes of hepatitis. (2 marks)

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12- Mention 2 causes of hypoalbuminemia. (2 marks)

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MCQ answers:

1		6		11		16		21	
2		7		12		17		22	
3		8		13		18		23	
4		9		14		19		24	
5		10		15		20		25	

Good Luck

2- Mention 4 oncogenes and their significance in tumors. (2 marks)

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3- Mention 4 parameters used to estimate kidney functions. (2 marks)

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4- Enumerate 4 constituents of routine urine examination. (2 marks)

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5- Enumerate 4 plasma myocardial infarction markers. (2marks)

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6- Give an account Creatine kinase. (2 marks)

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7- Mention 4 liver function tests (2 to test synthetic function & 2 to test liver cell damage). (2 marks)

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21. Positive HBe Ag indicates:

- a) Acute HBV infection
- b) Chronic HBV infection
- c) High viral load and high infectivity
- d) Low risk of HBV transmission

22. A patient with HBs Ag negative, Anti- HBs positive, anti- HBc negative is:

- a) Acutely infected
- b) Chronically infected
- c) Immune due to natural infection
- d) Immune due to hepatitis B vaccination

23. Deficiency of all of the following diets leads to accumulation of homocysteine except:

- a) Vitamin B2
- b) Vitamin B6
- c) Vitamin B12
- d) Folic acid

24. Number of isoenzymes of lactate dehydrogenase is:

- a) 2
- b) 3
- c) 4
- d) 5

25. Concerning Troponins I & T, which of the following is not true?

- a) They begin to rise 4-8 hours after myocardial infarction
- b) They reach peak within 12 hours.
- c) They are superior markers for diagnosing myocardial infarction.
- d) They rapidly disappear from plasma

Short essay Questions:

(25 Marks)

1- Enumerate 5 chemical characteristics (Types) of Tumor markers. (2.5 marks)

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14. Ammonia is detoxified by the liver into:

- a) Urea
- b) Uric acid
- c) Creatinine
- d) Bile

15. A 70 years old male with severe jaundice, total bilirubin 7.4 mg/dl, direct bilirubin 6.9 mg/dl, what is the most probable diagnosis?

- a) Autoimmune hemolytic anemia
- b) Hepatitis
- c) Cirrhosis
- d) Cancer pancreas obstructing bile duct

16. Which of the following is a specific character of direct bilirubin not indirect bilirubin?

- a) It can cross blood brain barrier.
- b) It is bound to albumin in blood.
- c) It is water soluble, so it appears in urine.
- d) It is the chief form of bilirubin in blood.

17. Hepatic biosynthesis of coagulation factors depends on:

- a) Vitamin A
- b) Vitamin D
- c) Vitamin C
- d) Vitamin K

18. The normal level of total plasma proteins is:

- a) 5 – 8.5 mg/dl
- b) 3.5 – 5 mg/dl
- c) 2 – 2.5 mg/dl
- d) 1.2 – 1.5 mg/dl

19. A rise in serum Alkaline phosphatase is often associated with elevated:

- a) Direct bilirubin
- b) Indirect bilirubin
- c) Prothrombin time
- d) ALT

20. It is important to measure 1, 25 dihydroxyvitamin D in:

- a) Rickets
- b) Hepatic patients
- c) Renal patients
- d) All suspected vitamin D deficiency patients

8. The earliest cardiac marker that appears in blood after myocardial infarction is:
- a. Creatine kinase & Troponins
 - b. Myoglobin
 - c. AST
 - d. LDH
9. Which of the following LDH isoenzymes are specific to cardiac muscles?
- a. LDH1 & LDH2
 - b. LDH2 & LDH3
 - c. LDH3 & LDH4
 - d. LDH4 & LDH5
10. Which of the following liver function tests can be used to measure the hepatic synthetic function?
- a) Serum Alkaline Phosphatase (ALP)
 - b) Serum Aspartate Transaminase (AST)
 - c) Prothrombin time
 - d) Lactate dehydrogenase
11. For individuals on warfarin for any disorder, International normalized ratio (INR) should be;
- a) 0.8 – 1.2
 - b) 1.2 – 2.0
 - c) 2.0 – 3.0
 - d) 3.0 – 4.0
12. In a case of jaundice due to hemolytic anemia, which of the following is true?
- a) Increased indirect bilirubin only in serum
 - b) Increased direct bilirubin only in serum
 - c) Increased both direct and indirect bilirubin in serum
 - d) Appearance of bilirubin in urine.
13. Test for hepatic excretory function includes:
- a) Bilirubin
 - b) ALT
 - c) Total protein
 - d) Albumin

Multiple Choice Questions (25 Questions – 1 mark each):

1. An oncofetal antigen that is used for monitoring of colorectal cancer and show higher levels in smokers:
 - a. AFP
 - b. CEA
 - c. hCG
 - d. Tissue polypeptide antigen (TPA)
2. Which of the following is used for monitoring of pancreatic cancer and bile ducts cancer:
 - a. CA.19- 9
 - b. CA. 72-4
 - c. CA.15-3
 - d. β 2-microglobulin
3. Which of the following is a prerenal cause of renal disease?
 - a. Glomerulonephritis
 - b. Hypertensive nephropathy
 - c. Severe blood loss
 - d. Prostatic cancer
4. The normal serum calcium level is:
 - a. 8.8 – 10.2 mg/ dl
 - b. 2.6 – 6 mg/dl
 - c. 136 – 146 mEq/ L
 - d. 101 – 109 mEq/ L
5. Which of the following is true concerning proteinuria?
 - a. Microalbuminuria can detect initial stages of renal impairment.
 - b. Frank proteinuria occurs when it is greater than 30 mg/ day.
 - c. Proteinuria is best evaluated by albumin/ creatinine ratio in spot urine.
 - d. Proteinuria is seen in chronic kidney diseases only.
6. The creatine kinase isoenzyme found mostly in cardiac muscles is:
 - a. CK-1
 - b. CK-2
 - c. CK-3
 - d. CK-4
7. A cardiac marker with high specificity is characterized by:
 - a. Abundant in cardiac tissue
 - b. Absent from non-myocardial tissue
 - c. Rapid release
 - d. Long half life in blood

III- Discuss the following statements: (20 Marks)

1- There is an important relationship between quality and competitive advantage.

(20 Marks)

1- There is an important relationship between quality and competitive advantage. (20 Marks)

2- Management commitment and understanding play important role in implementing total quality.

II- Choose the correct answer:

(15 Marks)

1- All these process will help to improve customer satisfaction and customer retention, except

a) determine customer satisfaction with the attributes	b) implement monitoring at the lowest levels
c) low cost with late delivery	d) tie customer feedback to your processes

2- The process of involving yourself and influencing others towards the accomplishment of goals is called

a) Leadership	b) Dictatorship	c) Sportsmanship	d) Autocracy
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3- Costs associated with improving quality or cost of conformance is called

a) Cost of Improvement	b) Cost of Planning
c) Cost of Good Quality	d) Cost of Poor Quality

4- What is the meaning by TQM?

a) Total Quality Measurements	b) Total Quality Management
c) Total Quality Maintenance	d) Total Quality Managers

5- It is important to promote open, frank, informed discussion and give participant sample opportunities to state their views, ask questions, and propose solutions. =

a) Mutual support	b) Make the training practical
c) Singleness of purpose	d) Encourage two-way communication

6- All these steps can help to provide products that meet customer needs, except

a) Mutual support	b) Product enhancements
c) Internal improvements	d) Improved productivity

7- Leaders use to create a sustainable competitive advantage for their organization.

a) Effective strategy	b) normal strategy	c) Papers	d) Media
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8- The Organizational strategies are typically set forth in a comprehensive document called the

a) Intermittent improvement	b) Ethics	c) strategic plan	d) Technical support
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9- Strategic execution involves implementing strategies set, one of the strategic planning process is

a) quality	b) make and implement a decision
c) law abiding	d) develop the guiding principles

10-..... considered as one of the important principles of the Business Ethics.

a) Fulfilling commitments	b) Technical support.
c) Competition	d) Better after-sales

1	2	3	4	5	6	7	8	9	10



Faculty of Science
Chemistry Department



Assiut University
Time: 3 hr

Quality Function Management and TQM (C 512)

Final-Term Exam for Professional Diploma in Quality Control Students, 2024

Answer the Following Questions:

(50 Marks)

I- Put right (√) or wrong (X) on the following statements Then Explain OR
Correct your answer :

(15 Marks)

1- Teamwork decrease the potential of individual members. ()

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2- Calibration, can be considered as one of the prevention cost items in the cost of good quality. ()

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3- Quality function deployment is an effective method for organizing customer feedback data so that it can be used to make ongoing design improvements. ()

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4- The best teams consist of members who have developed the people skills necessary to prevent and resolve conflict and to work cooperatively to solve problems. ()

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5- The TQM analysis is a strategic planning technique, It's a simple brainstorming exercise that helps you uncover strategic improvements for your business. ()

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6- Quality is a broad-based approach that encompasses all three of the elements of superior value. Continually improving the quality of products & processes, services, and costs. ()

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10- A shift to lower wavelength for an absorption in a spectrum known as:

- a) hyperchromic effect
- b) A hypochromic shift
- c) A bathochromic shift
- d) hypochromic effect

11- In chromatographic technique when the stationary phase is polar it's called:

- a) The reverse phase chromatography
- b) Gas chromatography
- c) Ion exchange chromatography
- d) Liquid chromatography

12- In Fluorimetry collision quenching leads to a loss in energy in:

- a) Internal conversion
- b) intersystem
- c) External
- d) All mentioned above

13- Mass spectrometry is only possible to perform in:

- a) Solid state
- b) Gaseous state
- c) Liquid state
- d) All mentioned above

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Good Luck

Prof. Dr. Elham Y. Hashem

- 1- Elevated temperature of the column may lead to
 - a) Increase in efficiency
 - b) Low resolution
 - c) Bleeding
 - d) Evaporation of analyte
- 2- An important advantage of a double-beam spectrophotometer over a single-beam spectrophotometer is
 - a) It requires same light source for UV-Vis and IR radiation
 - b) It permits cancellation of slow variation of source power
 - c) It can be used in conjunction with response detection systems
 - d) A greater range of wavelength can be used
- 3- In HPLC the time taken for a particular compound to travel through the column to the detector is known as:
 - a) Average time
 - b) Travel time
 - c) Retention time
 - d) Performance time
- 4- In which state of matter mass spectrometer is being performed?
 - a) Liquid
 - b) Solid
 - c) Plasma
 - d) Gaseous
- 5- In the classification of instruments that studies interaction between electromagnetic radiation and matter (atom and molecule), fluorescence is classified under which group of techniques:
 - a) Absorption spectroscopy
 - b) Emission spectroscopy
 - c) Mass spectroscopy
 - d) None of the above
- 6- In HPLC, the eluent strength is a measure of
 - a) Solvent absorption
 - b) Solvent adsorption
 - c) Solvent diffusivity
 - d) Solvent mixing index
- 7- How should the concentration of a coloured sample be determined?
 - a) Either a UV or Vis spectrophotometer
 - b) Using a UV spectrophotometer
 - c) Using a Vis spectrophotometric
 - d) Using an indicator solution and pH paper
- 8- In which of the following separation techniques, the separation based on the net charge of the molecule?
 - a) Affinity chromatography
 - b) Molecular exclusion chromatography
 - c) Isopycnic centrifugation
 - d) Ion exchange
- 9- What are the dimension of the molar absorptivity in the Beer's law expression?
 - a) Mole per Liter
 - b) Liter per mol. Centimetre
 - c) Gram per mole
 - d) Micrograms per square centimetre

Part (B)

Answer the following Questions: (25 marks)

Question (1): Spectrophotometric method is a suitable technique for determination of Secnidazole drug with 2,5-dihydroxybenzoic acid, briefly discuss. (3 marks)

Question (2): Sometimes, the method of standard addition is used for the analysis of an analyte. Describe the method and its merits. (3 marks)

Question (3): Define each of the following:

i) Internal conversion

ii) Stock shift

iii) Auxochrome

(6 marks)

Question (4): Choose the correct answers in the Table:

(13 marks)

1	2	3	4	5	6	7	8	9	10	11	12	13

11. Gel electrophoresis depends on the negatively-charged ions present on nucleic acids at neutral or basic pH to separate molecules on the basis of:
 - a) structure
 - b) charge
 - c) size
 12. Southern blotting involves the transfer of :
 - a) DNA to a nylon membrane
 - b) RNA to a nylon membrane
 - c) a,b
 13. Polymerase chain reaction (PCR) is a technique used to amplify specific regions of DNA for many purposes in laboratories such as:
 - a) the cloning of gene fragments to analyze genetic diseases, the determination of paternity and detection of genetic diseases
 - b) identification of contaminant foreign DNA in a sample, and the amplification of DNA for sequencing
 - c) a,b
 14. The first step in polymerase chain reaction (PCR) is to:
 - a) recreate the original DNA template strand (cDNA) by applying DNA nucleotides to the tRNA
 - b) recreate the original RNA template by applying DNA nucleotides to the mRNA
 - c) recreate the original DNA template strand (cDNA) by applying DNA nucleotides to the mRNA
 15. Gel electrophoresis is a method to separate protein according to:
 - a) their size
 - b) charge properties
 - c) a,b
-

Good Luck

Prof. Nagwa Abo El-Maali

1. Most nucleic acid extraction techniques involve steps to break open the cell and use enzymatic reactions to destroy all un-desired:
 - a) macromolecules
 - b) all metals
 - c) none of the previous
2. The absorbance of a DNA sample on a spectrophotometer or microplate reader can be used to calculate its concentration, it is measured at:
 - a) 240 nm
 - b) 260 nm
 - c) 270 nm
3. The basic method used for extraction of DNA is by doing using:
 - a) cell lysis using a detergent that disturbs the plasma membrane.
 - b) Treatment with protease to destroy protein, RNase to destroy RNA
 - c) a,b
4. Methods for the quantitation and analysis of nucleic acids are:
 - a) DNA/RNA absorbance measurements
 - b) Fluorometric quantitation of nucleic acids and SNP genotyping
 - c) a,b.
5. Single nucleotide polymorphisms (SNP) genotyping is a process for analyzing genetic differences among individuals by examining their:
 - a) DNA
 - b) RNA
 - c) a,b
6. Compared to spectrophotometric DNA quantitation, the fluorometric method provides key advantages such as:
 - a) significantly-increased sensitivity, high selectivity for double-stranded DNA (dsDNA) over single-stranded DNA (ssDNA) or RNA
 - b) improved contaminant tolerance (protein and carbohydrate molecules)
 - c) a,b
7. Genotyping is a process for analyzing genetic differences among individuals by examining their:
 - a) DNA sequences
 - b) protein sequences
 - c) a, b
8. Protein denaturation is the change of its folding structure and thus of its physical properties caused by:
 - a) heating, changes in pH,
 - b) exposure to certain chemicals
 - c) a, b
9. Electrophoresis is a method for the separation and analysis of large molecules, such as proteins or nucleic acids, by:
 - a) migrating a colloidal solution of them through a gel under the influence of an electric field
 - b) migrating a colloidal solution of them through a gel under the influence of the pH
 - c) migrating a colloidal solution of them through a gel under the influence of its concentration
10. Polymerase chain reaction is a technique in molecular biology for creating:
 - a) one copy of DNA from a sample
 - b) multiple copies of DNA from a sample
 - c) new copy of DNA from a sample



Part I: Answer the following questions (25 Marks)

1. Explain how you can perform a polymerase chain reaction. (5 Marks)

2. What are the basics that the techniques used to manipulate genetic materials DNA and RNA depend on? (5 Marks)

3. In the Table Choose the correct answer: (15 Marks)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15



Chemistry Department



Time allowed: 2hrs

C- 534 Biochemical Analysis Final Exam

June 2024

Part (I) Answer the following questions (25 Marks)

- (A) Tick (✓) for the right sentence and (x) to the false one: (8 Marks)
- 1) Forensic chemical/biochemical analysis is an essential tool in the criminal justice system, particularly when examining physical evidence to support criminal investigations and subsequent prosecutions.
 - 2) Urine has the lowest range of pH compared to other bodily fluids.
 - 3) The American Association for Clinical Chemistry says the normal urine pH range is between 1.5 and 8.
 - 4) The concentration of the two blood markers, CK and ALT in the sample is based on physiological levels present in healthy adults.
 - 5) In Forensic analysis, blood is a valuable source of information not only because of its genetic material, but also because of its unique composition of proteins and low molecular compounds.
 - 6) Estimating the age of a blood sample left at a crime scene can be a significantly important piece of information for the identification of the donor.
 - 7) Two protein biomarkers, the enzymes CK and ALT, were used together in parallel assays to determine the age of bloodstain samples.
 - 8) The enzymes CK and ALT biomarkers are used for the determination of the age of a sample, where their increase in time is followed.
- (B) Choose the correct answer: (2 Marks)
- 1) For determining the time elapsed from the point a blood sample was left at a crime scene to the point of discovery, Two blood markers, CK and ALT, are utilized to determine:
 - a) the age of the blood spot based on their respective denaturation rates
 - b) the age of the blood spot based on their respective naturation rates
 - c) a,b
 - 2) The mean concentrations of the biomarkers CK and ALT were based on their physiological levels present in a healthy adult:
 - a) CK (50mUml⁻¹) and ALT (20mUml⁻¹).
 - b) CK (100mUml⁻¹) and ALT (20mUml⁻¹).
 - c) CK (10mUml⁻¹) and ALT (20mUml⁻¹)
- (C) What are the inorganic and the organic constituents of urine? What are their normal concentrations? (5Marks)
- (D) What are the three types normally used for urine analysis? (2 Marks)
- (E) Define the following: (4 Marks)
- biochemical analysis of blood- Traditional forensic analysis methods.
- (F) Discuss the biocatalytic cascade (CK/ALT), which measure the enzymatic activities of both blood biomarkers during the aging process. (4 Marks)

Good Luck

Prof. Nagwa Abo El-Maali

Part (II)

(25 Marks)

I- Write short notes on the following:

(18 Mark)

- 1- Lowry method of protein analysis.
- 2- Lipid fractions by TLC.
- 3- Types of nutrients which are required in our daily diet.
- 4- Advantages and disadvantages of Kjeldahl method.
- 5- Chromatographic and electrophoretic methods of carbohydrates analysis.
- 6- Microbiological methods of vitamins.

II- Write (True) or (False) in front of the following statements:

(7 Mark)

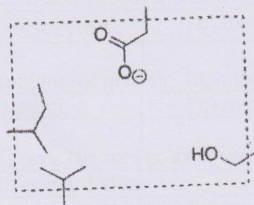
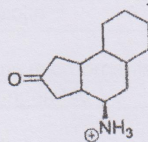
- 1- Microbial tests ranging from quantitative and qualitative significantly contribute to identification of food and outbreak of foodborne diseases. ()
- 2- The main disadvantage of Dumas method is that consumes more material as well as requires 20 min. incubation period. ()
- 3- The nutrients in food are essential for the depth, rearrangement and development in our organs system. ()
- 4- Choice of sampling plan depends upon the organism present in food, the nature of food and whether the food is raw or processed or eaten directly. ()
- 5- Food forensics analyses can weakly provide useful factual information to food manufacturers, restaurants, suppliers, consumers. ()
- 6- Foreign objects are a common consumer complaint, and can be introduced at any stage from processing to consumption. ()
- 7- Bacterial and fungal contaminations in food production are associated with various foodborne illnesses with symptoms that range from mild nausea to severe gastrointestinal poisoning and death. ()

Good Luck
Dr. Amany Abdelrahman

2) Write short notes on Pyruvate enzyme, indicating the type of enzyme, explain
your answer by equations:

3) This is a hypothetical small molecule and its potential binding sites. In this case, orient the molecule within the binding site in order to maximize binding interactions.

d)



Prof. Dr. Mona A. Abdel -Rahman

Good Luck

6 of 6

1	2	3	4	5	6	7	8	9	10

II- Answer on the Following Questions:

(10 Marks)

1) Compare between Amylose and Amylopectin
(Shape , types of bonds , Molecular weight , effect of Iodine)

Amylose	Amylopectin

Section (B) :

(25 Marks)

I- Choose the correct answer:

(15 Marks)

- 1- Which of the following statement is incorrect for lock-and-key model of enzyme action?

a) The substrate is a key that fits the lock of the active site
b) Only substrates with the matching shape can fit
c) The active site has a flexible shape
d) This model does not work for all enzymes.

- 2- Which of the following statements concerning enzyme is incorrect?

a) They are pivotal in all living entities which govern all the biological processes.
b) Not consumed during reaction
c) change during biological processes
d) If it is subjected to changes in temperature may lose its enzymatic ability

- 3- An enzyme that catalyzes the transfer of electrons from one form of a molecule to another during chemical processes.

a) Oxidoreductase	b) Transferase
c) Ligase	d) Isomerase

- 4- The effect of the inhibitor could be reduced and eventually overwhelmed with increasing amounts of substrate. In the case of

a) Suicide inhibition	b) uncompetitive inhibitor
c) competitive inhibition	d) non-competitive inhibition

- 5- An antimicrobial substance which inhibit microbial growth in food,

a) biotin	b) lysozyme	c) folate	d) vitamin B12
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- 6- Various microorganisms require for growth, high oxygen tension

a) anaerobic	b) aerobic	c) microaerobic	d) oxidoreductase
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- 7- A plot of enzyme activity (y-axis) vs. pH (x-axis) with other variables constant is a

a) straight line with an upward slope
b) line with an upward slope and a long flat top
c) line with an upward slope followed by a downward slope
d) straight horizontal line

- 8- Which of the following enzyme is involved in the browning of food ?

a) polyphenol oxidase (PPO)	b) reductase
c) dihydrofolate reductase (DHFR)	d) kinase

- 9- An enzyme active site is the location in an enzyme where substrate molecules

a) are generated	b) become catalysts
c) undergo change	d) more than one correct response

- 10- What are the parts of ATP molecule?

a) Adenine, ribose, pyruvate groups	b) Adenine, glucose, pyruvate groups
c) Adenine, glucose, phosphate groups	d) Adenine, ribose, phosphate groups

10. Proximate analysis of foods refers to determining the major components of:
- moisture, ash (total minerals)
 - lipids, protein, and carbohydrates
 - a,b
11. In food analysis, the food matrix is the greatest challenge to the analyst because different types of interferences can be caused by:
- high-fat
 - high-sugars
 - a,b
12. Validation of a method is important, as it is the use of:
- standard reference materials to ensure quality results
 - normal chemicals to ensure quality results
 - a,b
13. In food analysis, one must consider:
- the nature of the samples collected for the analysis
 - how representative the samples were of the whole and the number of samples analyzed
 - a,b
14. The process of taking samples from a population is called:
- sampling
 - small portion.
 - a,b
15. Sample size determination can be based on:
- precision analysis
 - power analysis
 - a,b.

Good Luck

Prof Nagwa Abo El-Maali

1. The major chemical change which occurs during the processing and storage of foods and lead to a deterioration in sensory quality:
 - a) Lipid oxidation
 - b) Enzymatic browning
 - c) a,b
2. Maillard reactions lead to changes in:
 - a) organoleptic properties (color, taste, smell, texture),
 - b) protein functionality and its digestibility
 - c) a,b
3. Moisture is used as a quality factor for:
 - a) Jams and jellies to prevent sugar crystallization
 - b) Prepared cereals – conventional, 4–8%; puffed, 7–8%
 - c) a,b
4. Government regulations and guidelines in the USA relevant to food analysis include:
 - a) nutrition labeling regulations
 - b) mandatory and voluntary standards
 - c) a,b
5. Current Good Manufacturing Practices for food include:
 - a) Manufacturing Packing
 - b) Hazard Analysis Critical Control Point (HACCP) systems
 - c) a,b
6. Chemical analysis of foods is an important part of a quality assurance program in food processing for:
 - a) ingredients and raw materials
 - b) processing and the finished products
 - c) a,b
7. Chemical analysis is important in formulating and developing new food products, evaluating new processes for:
 - a) making food products, and identifying the source of problems with unacceptable products
 - b) identifying the source of problems with acceptable products
 - c) a,b
8. Process control samples are usually analyzed by:
 - a) rapid methods
 - b) time-consuming methods
 - c) none of the previous
9. To select or modify methods used to determine the chemical composition and characteristics of foods, one must be familiar with:
 - a) the principles underlying the reports
 - b) the principles underlying the procedures and the critical steps
 - c) none of the previous



Faculty of Science
Chemistry Department



Time: 2 hrs
July 2024

**C- 501 Food Chemical Analysis Final Exam for
Professional Diploma in Biochemistry Students**

Section(A): Answer the following questions: (25 marks)

1) What are the steps that must be followed for chemical analysis of food samples? (5 marks)

2) Sampling purposes vary widely among different food industries; what are the most important sampling categories? (5 marks)

3) Choose the correct answer (answer in the Table): (15 marks)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Q4- Describe: (9 marks)

- A- Functions of Growth hormone on growth and metabolism of the body.
B- Four Laboratory finding in patients with diabetes insipidus.

(5 marks)

(4 marks)

Part (2): (25 marks)

I- Choose the correct answer of the following sentences: (10 marks)

- 1- Estrogen is a steroid hormone which synthesized and immediately released (True - False).
- 2- Kidney is the main target organ of (insulin - glucagon - aldosterone) hormone.
- 3- (Adrenaline - Cortisol - Aldosterone) has anti-inflammatory, anti-stress and metabolic actions.
- 4- Progesterone is a hormone produced (before – after) ovulation that is critical to successful implantation.
- 5- (E2 - Progesterone – AMH – TSH) is often used to check a woman's ability to produce eggs that can be fertilized for pregnancy.
- 6- (Fasting blood glucose - Random blood glucose - Haemoglobin A1C) test reflects the person's long-term trends in blood glucose levels rather than rapid changes.
- 7- It is (True - False) that insulin and glucagon are steroid hormones.
- 8- FSH play an important role in (control menstrual cycle - ovulation) in females.
- 9- Insulin secreted from (Alpha - Beta) cells of islets of Langerhans.
- 10- (Menstruation - Proliferative - Secretory) phase extends from day 15 until beginning of the next menstrual flow during the ovarian cycle.

II- Answer only Four from the following questions: (10 marks)

- 1- Mention the female hormonal tests which recommended in the case of infertility or menstrual cycle irregularities.
- 2- Give a short note about cushing syndrome (cause and symptoms).
- 3- Enumerate three functions of progesterone?
- 4- Compare between type-1 and type-2 diabetes mellitus.
- 5- Illustrate the site of secretion of the following hormones:
a) cortisol b) Estrogen c) Glucagon d) Adrenaline E) Testosterone

III- Explain with only a labeled diagram Two of the following: (5 marks)

- 1- Homeostasis of blood glucose level.
- 2- Synthesis and secretion of peptide hormones.
- 3- Structure of adrenal gland and hormones secreted by its parts.
- 4- Influence of testosterone on the body.

With our best wishes
Prof. Dr/ Marwa Abdel-Azez
Dr/ Hanan Waly
2024



Assiut University



Faculty of Science

Final exam of Endocrinology C503
(Biochemistry Diploma)
Two hours

Part (1): (25 marks)

Q1: Choose the best single answer of the following: (7 marks)

- 1- Which of the following is **FALSE** about parathyroid hormone (PTH) ?
 - a) PTH increases renal tubular reabsorption of Ca.
 - b) PTH acts directly on bone to increase calcium resorption.
 - c) Hypoparathyroidism causes decreased neuromuscular excitability.
 - d) PTH secretion is increased when plasma calcium levels decreased.
- 2- Which of the following about the growth hormone is **FALSE**?
 - a) Is stimulated by somatostatin released from the hypothalamus.
 - b) Increases when the blood glucose level falls.
 - c) Increases the size of viscera.
 - d) Stimulates liver production of somatomedins.
- 3- Blood calcium level is regulated by the hormones of:
 - a) Parathyroid gland.
 - b) Both parathyroid and thyroid glands.
 - c) Anterior Pituitary gland.
 - d) Posterior pituitary gland.
- 4- Which of the following is inconsistent with the diagnosis of Graves' disease?
 - a) Increased heart rate
 - b) Increased plasma levels of thyroxine (T4)
 - c) Exophthalmos
 - d) Increased plasma levels of thyroid-stimulating hormone
- 5- Parathyroid hormone:
 - a) Controls directly the rate of formation of 1, 25-dihydroxycholecalciferol.
 - b) Stimulates renal tubular phosphate reabsorption.
 - c) Stimulates directly the intestinal calcium reabsorption.
 - d) Stimulate sodium reabsorption from intestine.
- 6- Which of the following anterior pituitary hormones plays a major role in the regulation of a nonendocrine gland?
 - a) Adrenocorticotrophic hormone.
 - b) Thyroid-stimulating hormone.
 - c) Prolactin.
 - d) Follicle-stimulating hormone.
- 7- Thyroid hormone normally:
 - a) Inhibits glycolysis.
 - b) Enhances protein catabolism.
 - c) Inhibits the serum free fatty.
 - d) Stimulate utilization of glucose by the cells.

Q2- Case Study: (5 marks)

A female patient 45 years old, complained that, despite eating less, she had gained 10 kg in the past 6 months. She also complained that she has very little energy, always feels cold (when everyone else is hot), and is constipated. Her skin is yellowish. In addition, the physician noticed that her neck was very full.

- 1- Based on her symptoms, what is the most likely diagnosis of this condition?
- 2- How were her symptoms of weight gain and cold intolerance consistent with the diagnosis?
- 3- Write the hormonal profile which must be estimated.
- 4- How to differentiate between primary and secondary type of this case?
- 5- Explain yellowish discoloration of the skin.

Q3- Enumerate Four manifestations of hyperparathyroidism. (4 marks)

2- Describe the components of a microbial fuel cell and their applications with a labeled diagram.

3- Discuss the key steps in the biotechnological production of antibiotics.

4- Explain the mechanism of action of the following antibiotics on bacterial growth:
A. Penicillin and Vancomycin. B. Tetracycline and Erythromycin. C. Sulfa drugs and Polymyxin.

Prof. Dr.: Abdel-Raouf Khallil

Good Luck

Prof. Dr.: Mohamed H. Abdall.

A Table for your answers:-

1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24				

Q.3: Write (T) for True sentence or (F) for False sentence of 16 Sentences only of the following, and correct the wrong word whenever possible using the provided Table:- (16 Marks)

- 1- If the restriction enzymes do not cut the DNA at the specific sites, the DNA fragment obtained will have no sticky ends, and hence, the construction of recombinant DNA would be difficult.
- 2- Upstream processing is a sequential step in which the isolation, purification and preservation of final products are done before it is marketed
- 3- Plasmids of *E. coli* are the most common vectors used in transgenic plants.
- 4- Vancomycin is highly effective against Gram-negative bacteria.
4. An ideal antibiotic-producing microorganism should have slow growth and low biomass yield.
5. The microorganism should have fast growth and high biomass yield.
6. The primary objective of biofertilizer technology is to reduce crop productivity.
7. Mediator-less microbial fuel cells use thionine and methyl viologen.
8. The anode chamber in a microbial fuel cell contains bacteria that reduce oxygen to water.
9. Microbial fuel cells do not produce toxic end products.
10. Microbial fuel cells can be used for cardiac stimulation.
11. *Azotobacter* is used for biofertilizer production for legumes.
12. Cyanobacteria are used for biofertilizer production for wheat.
13. First-generation biofuels are derived from non-food sources, such as lignocellulosic biomass.
14. Biodiesel is chemically known as glycerol.
15. The primary source of biofuels is nuclear energy.
16. The purpose of mediators in microbial fuel cells to generate biohydrogen.
17. The efficiency of a microbial fuel cell is depending on Surface area of electrodes.

A Table for your answers (Only 16 points will be considered)

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17							

Q.4: Discuss BRIEFLY THREE ONLY of the following:- (9 Marks; 3 Marks for each point)

- 1- How is Biotechnology useful in developing food crops and in agriculture process?.

- 5- Recombinant rennin was the first recombinant food ingredient approved by FDA (in 1990), and is used in the manufacture of cheese:-
A). Chymosin. B). Insulin. C). Asparaginase D). Both A, B. E). None of all.
- 6- The most common vectors used in genes transfer in case of erythropoietin and Alteplase production are:-
A). *E. coli* plasmid. B). *Pichia pastoris* C). Chines Hamester ovary cells. D). None of all.
- 7- Antibiotics are traditionally produced through.
A). Genetic engineering. B). Fermentation. C). Chromatography. D). Photosynthesis.
- 8- Which class of antibiotics includes penicillin G and amoxicillin?
A). Beta-lactam. B). Macrolide. C). Tetracycline. D). Aminoglycoside. E). None of all.
- 9- What is the mechanism of action of fluoroquinolone antibiotics?
A). Inhibiting protein synthesis. B). Blocking cell wall synthesis
C). Preventing DNA replication. D). Disrupting cell membranes. E). None of all.
- 10- Which of the following inhibited folic acid synthesis in bacteria?
A). Sulfonamides. B). Erythromycin. C). Rifampin. D). Bacitracin. E). None of all.
- 11- Which step involves the extraction of the antibiotic from the culture broth?
A). Genetic enhancement. B). Formulation and packaging. C). Downstream processing.
D). Quality control. E). None of all.
- 12- Erythromycin inhibits bacterial protein synthesis by binding to which component of the ribosome?
A). 30S subunit. B). 50S subunit. C). 70S subunit. D). 80S subunit. E). None of all.
- 13- The process of converting atmospheric nitrogen into a plant-usable form is called:
A). Nitrogen fixation. B). Nitrogen assimilation. C). Nitrogen mineralization
D). Nitrogen immobilization. E). None of all.
- 14- Which of the following is not used as a carrier for biofertilizer technology?
A). Urea. B). Peat. C). Charcoal. D). lignite. E). None of all.
- 15- Which of the following is used in biofertilizer technology for legumes?
A). *Rhizobium*. B). *Bacillus*. C). *Escherichia coli*. D). *Agrobacterium*. E). None of all.
- 16- Which of the following is used as a biofertilizer for phosphate mobilization
A). *Aspergillus*. B). *Mycorrhizae*. C). *Rhizopus*. D). *Fusarium*. E). All of the above.
- 17- Which signal releases from the root hairs of leguminous plants to attract rhizobia?
A). Flavonoids. B). Proteins. C). Ammonia. D). Amino acid. E). None of all.
- 18- Which of the following is released by microorganisms to dissolve rock phosphate?
A). Amylase. B). Protease. C). Organic acid. D). Pectinase. E). All of the above.
- 19- What structure forms inside legume root hairs after rhizobia attachment, causing them to curl?
A). Infection thread. B). Nodule. C). Symbiosome. D). Rhizome. E). None of all.
- 20- What is a potential environmental hazard of excessive synthetic nitrogen fertilizer use?
A). Increased crop yields. B). Enhanced soil fertility. C). Groundwater contamination
D). Reduced greenhouse gas emissions. E). All of the above.
- 21- Which of the following are not involved in the oxidation of organic matter to produce fuel through fermentation?
A). Krebs cycle and electron transport chain. B). Glycolysis and substrate-level phosphorylation
C). Anaerobic respiration. D). Glycolysis and substrate-level phosphorylation. E). None of all.
- 22- What is the process used to produce biodiesel from vegetable oils or animal fats?
A). Transesterification. B). Fermentation. C). Pyrolysis. D). Gasification. E). All of the above.
- 23- What is the role of the anode chamber in a microbial fuel cell?
A). Production of electrons. B). Reduction of oxygen. C). Generation of proton gradient.
D). Oxidation of organic matter. E). None of all.
- 24- Biofuel technology refers to the use of:-
A). Chemical processes to produce renewable fuels. B). Physical processes to produce renewable fuels.
C). biological processes to produce renewable fuels. D). Thermal processes to produce renewable fuels



Assiut University
Faculty of Science
Department of Botany & Microbiology



Final Exam. For Post-Graduate Students (2nd Semester; 2023/2024)
Academic Program: Professional Diploma in Biochemistry
Course Title: Biotechnology. Course Code: B 518. Date: July 2024
Total Degree: 50 Marks. Allowable Time: Two hours.

Answer the Following Questions (Put your answers in the provided Tables).

NOTE: Questions are presented in five pages (1-5).

Pages 1 → 4

Q.1- Give the Scientific term for FIVE ONLY of the following:- (5 Marks; one for each)

- 1- The natural sweetener alternative to the table sugar sucrose produced from corn.
- 2- The thrombolytic agent that is manufactured by recombinant DNA technology and is approved by FDA for use in acute ischemic stroke, pulmonary embolism, acute myocardial infarction, and occluded catheters.
- 3- Treatment of genetic disorders by the insertion of a normal gene or correct gene for the defective or inactive gene into an individual with the help of and the normal gene replaces the defective or inactive gene and carries out its functions.
- 4- An enzyme used in recombinant DNA Technology for joining the desired gene fragment and the selected vector.
- 5- The glycoprotein produced in cell culture using recombinant DNA technology and is used for the treatment of patients with anemia associated with a chronic renal failure.
- 6- Vectors which are the most common and usually used for transgenic plants.
- 7- The bioactive molecules which are produced by fungi and used to treat cancer.
- 8- The thermostable enzymes which is commonly used for PCR amplification.

A Table for your answers

1		2	
3		4	
5		6	
7		8	

Q. 2. Choose the correct answers and write the correct answer if it is missing (Put your answers in the provided table): (20 Points should be answered, One Mark for each)

- 1- The characteristics of plasmids being used as a cloning vector are:
A). It should have an origin of replication. B). It should have a selectable marker.
C). It should have restriction sites. D). All of the above. E). None of all.
- 2- The most common type of restriction enzymes used in recombinant DNA technology are:-
A). Type I restriction enzymes. B). Type II restriction enzymes
C). Type III restriction enzymes. D). Type IV restriction enzymes. E). Ligase.
- 3- The bioactive molecules which are produced by fungi and used to treat cancer is a:-
A). Asparaginase. B). Proteolytic enzyme. C). Taxol. D). Non-catalytic protein. E). Both A&C.
- 4- Bacteria protect themselves from infection by bacteriophages by using
A). DNA ligases. B). DNA polymerases. C). Restriction enzymes. D). Cosmids. E)-All of the above.

- 3- Pheochromocytoma is a type of neuroendocrine tumor in adrenal medulla results in excess production of adrenaline or noradrenaline ()
- 4- TSH level test used to predict the start of menopause in addition to check infants with genitals that are not clearly identified as male or female ()
- 5- Heart secretes atrial natriuretic peptide hormone (ANP) which regulates sodium and water reabsorption by the kidneys ()
- 6- Androgens usually produced by genitals and small amount produced by pancreas ()
- 7- Insulin in humans is similar to insulin in animals ()
- 8- The best time for taking the blood sample to measure testosterone level is between 7 p.m. and 10 p.m. because during these hours, testosterone levels are typically the highest ()
- 9- Low concentration of potassium in blood stimulates aldosterone secretion ()
- 10- Testosterone increases the Basal Metabolic Rate (BMR) ()

With our best wishes
Prof. Dr/ Marwa Abdel-Azez
Dr/ Hanan Waly
2023

Part (2): (25 marks)

I- Put a circle around the correct answer of the following: (10 marks)

- 1- One of the following hormones responsible for enhancing gastric motility and secretion HCl into the stomach.
(Cortisol – Glucagon – Somatostatin – Gastrin)
- 2- Osteoporosis is may be resulted from (Chronic low – Too much) testosterone secretion in men.
- 3- Testosterone, cortisol and aldosterone are (Peptide – Steroid) hormones.
- 4- (Estrogen – Progesterone – FSH) hormone causes the development of female secondary sex characteristics at puberty.
- 5- Kidneys release (Atrial natriuretic peptide (ANP) – Renin - K^+) which is converted into angiotensin II that in turn stimulates aldosterone release.
- 6- During the menstrual cycle, the (menstruation – proliferative – secretory) phase extends from end of menstruation till mid-cycle in which the endometrium is regenerated under the influence of estrogen from the developing follicles.
- 7- (Aldosterone – Cortisol – Adrenaline – Glucagon) has immunosuppressive function which can be used to prevent rejection in organ transplantation.
- 8- (E2 - Progesterone – AMH – TSH) test is often used to check the woman's ovarian reserve.
- 9- Diabetes mellitus (Type 1 – Type 2) is characterized by insulin resistance and usually develops after age of 40.
- 10- All of the following are from functions of insulin except.....
 - a) Stimulates glucose uptake by muscle and adipose tissue.
 - b) Increase formation of fatty acids and lipid synthesis.
 - c) Conversion of stored glycogen in the liver to glucose.
 - d) Stimulate protein synthesis.

II- Complete the following sentences: (5 marks)

- 1- cells are stimulated by hormone to secrete testosterone that is essential for the development and maintenance of spermatogenesis.
- 2- There are reversible diabetes conditions include and
- 3- From the functions of adrenal gland medulla hormones and in response to stress.
- 4- Polypeptide and protein hormones are soluble, allowing them to enter the circulatory system easily. They are stored in of different endocrine cells until needed.
- 5- results from excessive production of cortisol from the adrenal glands causing buffalo hump and purple stretch marks on the abdomen. Whereas, known as primary adrenal insufficiency characterized by low levels of adrenal hormones and patients may have bronze skin pigmentation.

III- Put (True) or (False) and CORRECT the false statements: (10 marks)

- 1- Diabetes can be diagnosed if random glucose levels are higher than 200 mg/dL ()
- 2- Progesterone increases uterine contraction during pregnancy ()

- 34- A person with hypothyroidism would exhibit:
- Tachycardia.
 - Increased metabolic rate.
 - Heat intolerance.
 - Sleepiness.
- 35- The supraoptic nucleus of the hypothalamus is believed to control secretion of which of the following hormones?
- Antidiuretic hormone (arginine vasopressin).
 - Oxytocin.
 - Growth hormone.
 - Adrenocorticotrophic hormone.
- 36- Which of the following about human growth hormone is CORRECT?
- It is synthesized in the hypothalamus.
 - It stimulates production of somatomedins by the liver.
 - Its release is stimulated by somatostatin.
 - It causes a decrease in lipolysis.
- 37- The basic effects of growth hormone on body metabolism include:
- Decreasing the rate of protein synthesis.
 - Increasing the rate of use of carbohydrate.
 - Increasing the use of fats for energy.
 - Inhibition of insulin-like growth factor 1.
- 38- The hormone involved in the ejection of milk from a lactating mammary gland is:
- Prolactin
 - Growth hormone
 - FSH
 - Oxytocin
- 39- Hyperparathyroidism causes decreased metabolic rate.
- True
 - False
- 40- T3 appears to be the most active hormone at the cellular level, being 3-5 times more active than T3.
- True
 - False
- 41- A low level of parathyroid hormone is a one cause for hypocalcaemia:
- True.
 - False.
- 42- Growth hormone stimulates the liver and other tissues to produce small proteins called:
- Somatomedins
 - Growth hormone releasing hormone
 - Growth hormone
 - Inhibitory factor
- 43- Growth hormone increases the circulating insulin like growth factor-1 which exerts direct (inhibitory - stimulatory) action on growth hormone secretion from the anterior pituitary.
- 44- Normal total plasma Ca^{++} of about:
- 9-11 mg/100 ml
 - 7-9 mg/100 ml
 - 4.5-5.4 mg/100 ml
 - 11-14 mg/100 ml
- 45- Normal values are of blood level of parathyroid hormone is:
- 55-75 pg/ml
 - 10-21 pg/ml
 - 10-55 gm/ml
 - 10 - 55 pg/ml
- 46- Parathyroid hormone (increases - decreases) renal tubular reabsorption of Po^{+4}
- 47- Tetany is (increased - decreased) neuromuscular excitability.
- 48- Antidiuretic hormone (increase - decrease) in the permeability of the collecting ducts of the kidney to the water.
- 49- Increased levels of antidiuretic hormone producing (very concentrated – very diluted urine).
- 50- Oxytocin hormone is secreted by the anterior pituitary gland:
- True.
 - False.

- 20- A 45-year-old woman is noted to have fatigue and cold intolerance and is diagnosed with hypothyroidism. Her physician suspects a primary cause (in thyroid gland). Which of the following laboratory findings is most consistent with this condition?
- Low thyroxine and low TSH.
 - Low thyroxine and high TSH.
 - High thyroxine and high TSH.
 - High GH and Low GHRH.
- 21- The hormone acts on the intestine and causes increased calcium absorption:
- Corticotropin releasing hormone (CRH).
 - Vitamin D3 (1, 25-dihydroxycholecalciferol).
 - Aldosterone hormone.
 - Pancreatic polypeptide.
- 22- One of the following is a symptom of manifest tetany:
- Carpal spasm.
 - Renal stones.
 - Bone fracture.
 - Hypercalciuria.
- 23- Thyroid hormone secretion is stimulated by hot weather.
- True
 - False
- 24- In physiological amounts, parathyroid hormone has protein anabolic effect.
- True
 - False
- 25- Normal level of thyroid hormones stimulates protein synthesis.
- True
 - False
- 26- Growth hormone causes protein catabolism.
- True
 - False
- 27 - Cretinism is a disease caused by extreme thyroid hormone deficiency after puberty.
- True
 - False
- 28- There is increase in both thyroid gland size and thyroid hormones secretion in myxedema.
- True
 - False
- 29- Which of the following increase the thyroid hormone levels in the blood?
- Increase iodine levels in the circulation.
 - Elevated thyroid stimulating immunoglobulin levels in the blood.
 - Exposure to hot environment.
 - Increase uptake of thiocyanate in diet.
- 30- Which of the following hormones are transported bound with plasma protein?
- Insulin.
 - Growth hormone (GH).
 - Thyroxine.
 - Glucagon.
- 31- Thyroid hormone increases all of the following EXCEPT:
- Heart rate.
 - Venous return.
 - Cardiac output.
 - Blood pressure and mean arterial pressure.
- 32- The iodine uptake by the thyroid gland is blocked by:
- Thyroid inhibitory hormone
 - Thyroid stimulating immunoglobulin (TSI)
 - Thiocyanates
 - Iodine
- 33- Iodides are stored in the thyroid follicles mainly in the form of:
- Thyroxine.
 - Thyroglobulin.
 - Triiodotyrosine.
 - Diiodotyrosine.

9- Which of the following is NOT a function of thyroid hormone?

- a. Increase the basal metabolic rate.
- b. Increases heart rate and stroke volume.
- c. Stimulate physical, mental and sexual growth.
- d. Decrease the synthesis of vitamin A from carotenes.

10- Hyperparathyroidism causes:

- a. Manifest tetany.
- b. Increased neuromuscular excitability.
- c. Decrease the serum levels of calcium below the normal.
- d. Hypercalciuria and formation of stones in the kidney.

11- Antidiuretic hormone (ADH) is synthesized mainly in:

- a. Supra optic nuclei
- b. Para optic nuclei
- c. Para ventricular nuclei
- d. Anterior pituitary

12- Decrease in growth hormone secretion before puberty produces:

- a. Acromegaly.
- b. Pituitary dwarfism.
- c. Gigantism.
- d. Infantilism.

13- Nephrogenic diabetes insipidus is endocrine abnormality due to:

- a. Decrease ADH release from the posterior pituitary.
- b. Renal insensitivity in response to the effect of ADH.
- c. Decrease of insulin secretion from B cells of pancreas.
- d. Increase ADH release from the posterior pituitary gland.

14- The purpose of the hypothalamic- hypophyseal portal circulation is enabled the hypothalamic hormones to be delivered to the systemic circulation.

- a. True
- b. False

15- All of the following are hormones of the anterior pituitary EXCEPT:

- a. Antidiuretic hormone (ADH).
- b. Follicle- stimulating hormone (FSH).
- c. Growth hormone (GH).
- d. Thyroid-stimulating hormone (TSH).

16- Which of the following is not secreted by the thyroid gland?

- a. Thyroxin (T4)
- b. Calcitonin
- c. Parathormone hormone
- d. Triiodothyronine (T3)

17- Which of the following is the principal thermogenic hormone (increase heat production)?

- a. Parathyroid hormone
- b. ADH
- c. Thyroxine
- d. Aldosterone

18- The yellowish color of the skin in myxedema is due to:

- a. Carotenemia
- b. Increased bilirubin
- c. Anemia
- d. Decrease cholesterol

19- Which of the following would you suspect if there is a pituitary tumor secreting thyroid stimulating hormone (TSH)?

- a. Decreased TSH secretion and increased thyroxin.
- b. Increased both TSH and thyroxin secretion.
- c. Increased TSH secretion and decreased thyroxin.
- d. Decrease both TSH and thyroxin secretion.



Assiut University



Faculty of Science

**Final exam of Endocrinology C503
(Biochemistry Diploma)
Two hours**

Part (1): (25 marks)

Choose the correct answer of the following:

- 1- Which one of the following factors inhibits thyroxine release:
 - a. Thyrotropin releasing hormone (TRH).
 - b. Cold climate.
 - c. Hot weather.
 - d. Thyroid stimulating immunoglobulins (TSI)
- 2- Which of the following is a function of thyroid hormone?
 - a. Essential for the normal development of the nervous system.
 - b. Decreases the strength of myocardial contraction.
 - c. Decreases the appetite and food intake.
 - d. Has anti allergic effect.
- 3- Which of the following statements regarding the thyroid gland are correct?
 - a. A person with hyperthyroidism has a cold intolerance.
 - b. Calcitonin is secreted by the parafollicular cells of the thyroid gland.
 - c. The maximum amount of thyroid hormones binds with plasma protein albumin.
 - d. T4 is more biologically potent than T3.
- 4- Which of the following is NOT a function of thyroid hormone?
 - a. Increase the basal metabolic rate.
 - b. Increases heart rate and stroke volume.
 - c. Stimulate physical, mental and sexual growth.
 - d. Decrease the synthesis of vitamin A from carotenes.
- 5- Which one of the following hormones has the greatest effect on basal metabolic rate:
 - a. Growth hormone
 - b. Cortisol
 - c. Somatostatin
 - d. Thyroxine
- 6- A 33-year-old woman is noted by her physician to have some fatigue and some coarse skin. She has weight gain and low heart rate. The following laboratories has been reported:
 TSH 0.1 mU/L (0.35-6.0 mU/L) Free thyroxine 0.3 ng/dL (0.8-2.7 ng/dL), total thyroxine 2µg/dL (4.5-12.0 µg/dL) and Thyroid-binding globulin (TBG) 10 ng/mL (15-34 mg/L).
 Which of the following is the most likely diagnosis?
 - a. Hyperthyroidism
 - b. Primary hypothyroidism
 - c. Normal thyroid status
 - d. Secondary hypothyroidism
- 7- Thyroid hormone decreases:
 - a. Rate of absorption of carbohydrates.
 - b. Circulating cholesterol levels.
 - c. O2 consumption in almost all metabolically active tissue.
 - d. Nitrogen excretion.
- 8- Which of the following is NOT TRUE parathyroid hormone?
 - a. PTH increases renal tubular reabsorption of Ca.
 - b. PTH acts directly on bone to increase calcium absorption.
 - c. Hypoparathyroidism causes decreased neuromuscular excitability.
 - d. PTH secretion is increased when plasma calcium levels decreased.

Course title: Enzymology (Z502)
Second Semester 2022-2023
Time: 2 hours
Total degree: 50



المقرر: علم الانزيمات (Z502)
الفصل الدراسي الثاني 2022-2023
الزمن: ساعتان
الدرجة الكلية: 50

Question 1: Fill in the following sentences

(25 marks)

1. Digestion of ingested microbes by enzymes occurs within
2. TB bacilli is a type of bacteria causing
3. is an inherited deficiency in the production of one of several subunits of NADPH oxidase.
4. is an enzyme in saliva and tears and acts as a natural substance that hydrolyzes bacterial cell wall.
5. Arginine depletion was ascribed as in cancer treatment for arginine auxotrophic tumors, hence the enzyme is used as such treatment.
6. is seen in the inner membrane of mitochondria and is the predominant glutamine-using enzyme in the brain.
7. enzyme is used for the treatment of acute lymphoblastic leukemia.
8. Skin Ulcer is an open wound that develops on the skin as a result of injury, poor circulation, or pressure. Hence, enzyme can be used as a treatment for the hydrolysis of
9. enzyme is employed in medicine to increase drug diffusion and reverse the effects of HA filler injections and is also used to inhibit viral replication.
10. is an enzyme that converts plasminogen to plasmin and is used for medical treatment of myocardial infarction.
11. Once CTLs recognize the target cells they produce toxic proteins such as and which penetrate the target cell through the holes and activates
12. is congenital perforin deficiency and is considered a rare cause of human immunopathology and immune dysregulation.
13. is characterized by cellular swelling caused by a failure in ion transporter function.
14. Lack of apoptosis in humans can lead to webbed fingers phenomenon called
15. Most of the functional plasma enzymes are synthesized in the
16. and are examples of non-functional plasma enzymes, and their substrates are in the plasma.
17. Lipase enzyme is used for the diagnosis of
18. is used for the diagnosis of metastatic carcinoma of the prostate, while phosphatase (alkaline) is used for the diagnosis of

انتهت الأسئلة مع تمنياتنا بالنجاح

أ.د/ جمال جمال بدر

أستاذ المناعة - كلية العلوم - جامعة أسيوط

Question 1: Fill in the following sentences (25 marks)

4- Elevation of non- plasma enzymes due to.....

- a. tissue injury & necrosis b. obstructive processes c. abnormal rate of synthesis d. All are true

25- Enzymes assay usually carried out for the diagnosis of myocardial infarction are.....

- a. CPK b. AST c. LDH d. All are true

II- Indicate whether the sentence is true (T) or false (F) (12.5 Marks)

1- Inhibition of HMG-CoA reductase by cholesterol is example for feedback inhibition. ()

2- Anti cancer drugs as competitive inhibitors are useful chemotherapeutic agents. ()

3- Enzyme assays measure either the consumption of substrate or production of product over time. ()

4- Blank solution contains everything except the compound to be measured. ()

5- In discontinuous assay of ALT, addition of 2,4-dinitrophenylhydrazine (DNPH) stops the reaction and forms the 2,4-dinitrophenylhydrazone measured at 360nm. ()

6- Glucose oxidase enzyme (EC number 1.1.3.4) is an oxidoreductase that catalyses the oxidation of glucose to hydrogen peroxide and D-glucono- δ -lactone. ()

7- Thyroid peroxidase oxidizes iodide ions to form iodine atoms for addition onto tyrosine residues on thyroglobulin for the production of T_4 and T_3 . ()

8- Cytochromes P450 (CYPs) are a superfamily of enzymes containing heme as a cofactor that function as monooxygenases in mitochondria. ()

9- Protein kinase C is activated by signals such as increases in the level of DAG or Ca^{2+} . ()

10- Carbonic anhydrase plays an important role in respiration and maintained blood pH 7.4 by influencing CO_2 transport in the blood. ()

11- Enzyme inhibitors are substances which alter the catalytic action of the enzyme and consequently slow down, or in some cases, stop catalysis. ()

12- Non-plasma specific enzymes are either absent or present in low concentrations in plasma. ()

13- In the liver ALP is attached to biliary canicular and sinusoid membranes of the hepatocytes, decreased ALP level is usually associated with blockage of the bile ducts. ()

14- Amylase is used clinically in the diagnosis of pancreatic disorders. ()

15- Serum lipase and amylase level in peritoneal fluid were used to differentiate between acute pancreatitis and other abdominal disorders. ()

11-Digestive enzymes breakdown ingested food molecules by.....

- a. Oxidation b. Hydrolysis c. Reduction d. Conjugation

12-Pepsin is example for which class of enzymes?

- a. Hydrolases b. Ligases c. Oxidoreductases d. Lyases

13-Name the enzyme which catalyzes the oxidation-reduction reaction?

- a. Transaminase b. Glutamine synthetase c. Phosphofructokinase d. Oxidoreductase

14-In continuous assay of ALT the absorbance at 340nm is measured each minute without stopping the reaction, resulting in decreased readings due to.....

- a- oxidation of NADH b. oxidation of NADPH c. reduction of NADH d. reduction of NADPH

15- Classification of enzymes has been recognized by.....

- a- International Union of Physiology b- International Union of Biochemistry
c- International Union of Biotechnology d-International Union of Genetic Engineering

16-19-.....is used as a marker to detect acute pancreatitis.

- a) amylase b) acid phosphatase c) γ glutamyltransferase d) Creatine kinase

17-.....is used as a marker to detect myocardial infarction

- a) LDH b) Creatine kinase c) AST d) All of these

18- Which of the following can be used to determine the rate of enzyme-catalyzed reactions?

- a. rate of disappearance of the enzyme b. rate of disappearance of the substrate
c. rate of disappearance of the product d. change in volume of the solution

19- What is the process called by which proteins lose their shape and function?

- a. Denaturation b. Hydrolysis c. Deamination d. Transamination

20- Pepsin is examples for which class of enzymes.

- a. hydrolases b. ligases c. oxidoreductases d. lyases

21- The coenzyme is basically a

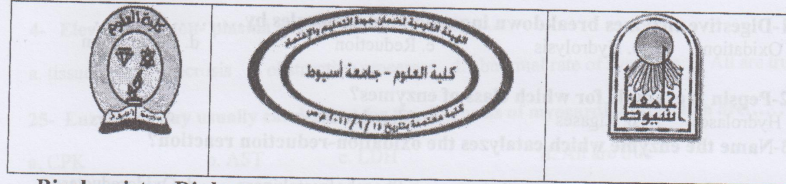
- a. protein b. carbohydrate c. vitamin d. none of these

22- The first enzyme to mix with food in the digestive tract is.....

- a. pepsin b. cellulose c. amylase d. trypsin

23- Which of the following organ expresses glucokinase?

- a. Kidney b. Muscle c. Liver d. Brain



Biochemistry Diploma

Second semester 20/6/2023

Enzymology (C503) Exam

Period of Exam 2 hours

I-Choose the correct answer (12.5 marks)

- 1-The general mechanism is that an enzyme acts by.....
a. ↓ activation energy b. ↑ activation energy c. ↓ pH value d. ↑ the pH value
- 2-An enzyme that joins the ends of two strands of nucleic acid is:
a. Polymerase b. ligase c. synthetase d. Helicase
- 3-Which of the following is produced with the combination of apoenzyme and coenzyme.....
a. Holoenzyme b. Enzyme substrate complex c. Prosthetic group d. Enzyme product complex
- 4-Which one among them is the example of competitive inhibition of an enzyme.....
a. succinic dehydrogenase by malonic acid b. cytochrome oxidase by cyanide
c. hexokinase by glucose-6-phosphate d. carbonic anhydrase by carbon dioxide
- 5-The enzyme minus its coenzyme known as.....
a. apoenzyme b. metalloenzyme c. isoenzyme d. All of these
- 6-Which among them is not attribute of enzymes:
a. specific in nature b. protein in chemistry c. consumed in reaction d. increased rate of reaction
- 7-Iodoacetate- glyceraldehyde 3- phosphate dehydrogenase is inhibitor of enzymes.
a. Reversible b. Irreversible. c. Allosteric d. All of above
- 8-Feed back inhibition means.....
a. initial product inhibition b. end product inhibition c. enzymatic induction d. none of the above
- 9-The enzyme which break up nucleic acid into nucleotides are called.....
a. Nucleases b. Amylases c. Proteases d. Hydrolases
- 10-Enzymes are sensitive to change
a. pH b. Temperature c. Substrate concentration d. All of them

- 13- D-glucose & D-mannose are ----- while D-glucose & D-galactose are -----.
- epimers at C-2 & epimers at C-4
 - epimers at C-4 & epimers at C-2
 - hemiacetal at C-2 & hemiacetal at C-4
 - hemiacetal at C-4 & hemiketal at C-2
- 14- When enzyme attaches with Cofactor unit it become active and called -----.
- Holoenzyme
 - Apoenzyme
 - Substrate
 - Prosthetic group
- 15- Choose the major intrinsic factors affecting on microbial growth in food?
- Hydrogen ion concentration (pH)
 - Moisture content and nutrient content of the food
 - Antimicrobial substances added and biological structures.
 - All of the above
- 16- Lowering of water activity in food preservation process can be achieved by the following methods *EXCEPT* -----.
- Addition of high content of salt
 - Addition of high content of sugar
 - Sun/air drying
 - Fermentation
- 17- Which are Bacteria can grow between (20 °C & -10 °C) in unfrozen media?
- Psychrophilic bacteria
 - Mesophilic bacteria
 - Thermophilic bacteria
 - None of the above
- 18- Phenolases (PPO) enzyme can catalyze oxidation of -----into -----.
- o*-diphenols, *o*-quinones
 - o*-diphenols, *o*-quinones
 - mono-phenols, *o*-diphenols
 - o*-quinones, *o*-diphenols

1	2	3	4	5	6	7	8	9	10	11	12

13	14	15	16	17	18

2- Answer *ALL* of the following with either (✓) or (X)? (7 Marks)

- Sugar competes with the starch for water, so more water available for gelatinization. ()
- When the food has higher amounts of proteins, vitamins and some fat it is called body regulating food. ()
- Microorganisms that are able to grow in acid environment are called acidophilic microorganisms. ()
- Gentamicin is an example of a naturally occurring product derived from carbohydrates. ()
- Glycosidic bonds are readily hydrolyzed by acid but resist cleavage by base. ()
- A cofactor is a non-protein chemical compound that is not bound to an enzyme. ()
- Condition used in the low temperature-long time pasteurization process are 72°C for 15 seconds. ()

Good Luck

Prof. Dr. Hassan Abdou Kotb

Final Exam of Food Chemistry & Analysis (C501) for Diploma Level Students

Answer all of the following questions? (25 Marks)

1- Choose the correct answer for ALL of the following? (18 Marks)

(Final answers must be outlined in the tables below this section)

- 1- Choose the proper products from Heterofermentation process of lactic acid?
 - a) Ethanol, CO₂
 - b) Lactic acid
 - c) Lactic acid, Acetic acid, Ethanol, CO₂
 - d) Butyric acid, Acetic acid, CO₂, H₂
- 2- Most enzyme activities are only within a pH range of -----.
 - a) 3-7 units
 - b) 2-8 units
 - c) 3-4 units
 - d) 1-11 units
- 3- Which of the following is NOT one of food spoilage causes?
 - a) Growth and activity of microorganisms
 - b) Food begin to deteriorate during harvest
 - c) Enzyme activity and chemical reactions
 - d) Vermin and physical changes
- 4- Amongst the following chemical processes, which one is NOT specialized to food protein?
 - a) Buffering
 - b) Fermentation
 - c) Condensation
 - d) Denaturation
- 5- Which of the following is the biosynthesis product of chlorophyll that is responsible for greening of potato?
 - a) Cholesterol
 - b) Carbon dioxide
 - c) Alanine
 - d) o-Quinone
- 6- Which of the following is NOT considering as chemical changes caused by microorganisms?
 - a) Degradation of DNA
 - b) Degradation of carbohydrates
 - c) Degradation of N-compounds
 - d) Degradation of lipids
- 7- L-ascorbic acid is an excellent ----- agent acting as antioxidants.
 - a) oxidizing
 - b) bleached
 - c) denaturizing
 - d) reducing
- 8- State the type of glycosidic linkage presented in cellobiose?
 - a) α 1,4-glycosidic linkage
 - b) β 1,2-glycosidic linkage
 - c) α 1,2-glycosidic linkage
 - d) β 1,4-glycosidic linkage
- 9- Under which of the following conditions, starch can undergoes Gelation process?
 - a) When a starch is heated without water
 - b) When a starch is heated in water
 - c) When a starch paste cools
 - d) When more sugar added
- 10- Which of the following statement is NOT true for amylopectin?
 - a) Branched component of starch
 - b) Molecular weight: 50-500 million
 - c) Contains only α -1,4-glycosidic
 - d) Causes purplish red color with iodine
- 11- Refrigeration slows enzyme activity while boiling temperatures ----- the enzyme.
 - a) duplicate
 - b) reduce
 - c) appropriate
 - d) denature
- 12- Which bacteria is the most likely to grow in vacuum packed foods?
 - a) Aerobic bacteria
 - b) Aerobic molds
 - c) Microaerophilic bacteria
 - d) All of the above

- b. texture and odor versus dislike
- c. Consumer Panels- usually consist of 200 plus people who determine dislike, desirability.
- 12. Flavours are classified into the following groups by correlating their aromas, structures and routes of formation.
 - a. Pyrazines having nutty, roasted baked aromas, cyclic enolones like Maltolm Isomalto! having caramel aromas
 - b. Polycarbonyls like Pyruvaldehyde has burnt, pungent aromas
 - c. a, b.
- 13. The major types of reactions occur in fats are heated:
 - a. hydrolysis, oxidation
 - b. polymerization
 - c. a, b.
- 14. Fats' oxidation leads to the formation of :
 - a. hydroperoxides
 - b. secondary oxidation products such as ketoacids, hydroxyacids, epoxyacids and carbonyl compounds.
 - c. a,b.
- 15. Reactions during food processing can lead to:
 - a. loss of some essential amino acids, such as lysine
 - b. high vitamins and formation of toxic derivatives.
 - c. a,b.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

B. Tick (✓) to the right sentence and (X) to the false one in the provided Table. (10 marks)

- 1. Carbohydrates, proteins, fats and vitamins can react with each other and with various food additives to produce toxic materials.
- 2. Proteins are the most reactive of the food components and they can combine with sugars, fats, polyphenols, vitamin B6 and with various chemical additives.
- 3. Early Maillard reaction is very important in milk products, which can lose a large proportion of their lysine content during processing and storage without any visible changes in colour.
- 4. Only about 10 % of the deoxyketosyl compound of lysine is released during digestion and then absorbed by passive diffusion and excreted unchanged in the urine. .
- 5. There are three main pathways in the advanced Maillard reaction, all leading to the production of brown pigments. .
- 6. N-heterocyclic compounds (pyrazines, pyrroles) is mainly responsible for the roasted, bready and nutty flavours of heated foods.
- 7. Strecker degradation involves the degradation of free amino acids by the dicarbonyl compounds formed in the first pathway in the advanced Maillard reaction.
- 8. The most distinguishing feature of fats versus other components (carbohydrates, protein) is their solubility.
- 9. Fats' hydrolysis results in the formation of free fatty acids which at high concentration can notably affect the taste of the oil.
- 10. The vitamins C, B6, thiamin and folic acid are the most sensitive to food processing.

1	2	3	4	5	6	7	8	9	10

Good Luck

Prof. Nagwa Abo El- maali



Faculty of Science
Chemistry Department



Time: 1 hr
Feb 2023

**C- 501 Food Chemical Analysis final Exam for
Professional Diploma in Biochemistry students**

A. Choose the correct answer (answer in the provided Table) : (15 marks)

1. Carbohydrates, proteins, fats and vitamins can react with each other and with various food additives such as nitrites, sulphite, aldehydes and alkali to give food products of :
 - a. higher nutritional value;
 - b. desirable and undesirable browning and flavours
 - c. a, b.
2. The later Maillard reactions lead to:
 - a. the brown pigments;
 - b. produce many desirable flavours and odours,
 - c. a, b.
3. The Maillard flavours have been divided into four main groups, the most important being:
 - a. the N-heterocyclics (responsible for roasted, nutty and baked flavours)
 - b. cyclic enolones responsible for caramel flavours.
 - c. a, b.
4. Fission of methyl dicarbonyl intermediates (from degradation of the sugar moiety) can give
 - a. aldehydes, dicarbonyls
 - b. oxidants,
 - c. a,b.
5. Among the official methods for food analysis used in food processing organizations are:
 - a. Association of the Official Analytical Chemists (AOAC)
 - b. Association of Cereal Chemists (AACC)
 - c. a, b.
6. Factors affecting a sampling plan for food analysis are:
 - a. purpose of inspection (acceptance/rejection, variability/ average)
 - b. nature of the product (homogenous, unit, cost),
 - c. a,b.
7. Developing a sampling plan for food analysis requires:
 - a. number of samples selected (variation in properties, cost, type of analytical techniques),
 - b. sample size(random sampling vs systematic sampling vs judgment sampling)
 - c. the manner in which the samples are analyzed.
8. The disadvantages of Lowry method are:
 - a. color development not proportional to protein concentration
 - b. color varying with different proteins and interference (sugars, lipids, phosphate buffers)
 - c. a, b.
9. We need macro minerals like Ca, P, Na ,K, Mg, Cl, S in a concentration level of:
 - a. >100 mg/day
 - b. = 10 mg/day
 - c. < 100 mg/day
10. The disadvantages of ion-selective electrodes are:
 - a. inability to measure below 12-30 ppm
 - b. unreliable at low concentration ($10^{-4}M$)
 - c. a, b.
11. Food sensory properties include:
 - a. Trained Sensory Panels – a few well- trained people that characterize flavor

Course title: Biological Fluids (MD503)
First Semester 2022-2023
Time: 2 hours
Total degree: 50



المقرر: علم السوائل البيولوجية (MD503)
الفصل الدراسي الأول 2022-2023
الزمن: ساعتان
الدرجة الكلية : 50

Question 2: Fill in the following sentences: (15 marks)

1. The four steps of hemostasis are and
2. Blood platelets are originated from large cells known as and when the platelet count becomes low this is an indicator for a disease known as
3. The normal bleeding time is
4. is due to deficiency of coagulation factor VIII, while is due to deficiency of coagulation factor XI.
5. is a decrease in the number of neutrophil count.
6. A person with O blood group can transfuse blood to all the other blood groups because
7. Allotransplants is defined as
8. Cellular rejection is mediated by
9. All WBCs originate in the bone marrow from two types of progenitor stem cells and

Question3: (25 questions 1mark each) Choose the Correct answer:

1. Where is synovial fluid found?
 - a. In the joints between the articular cartilage of the bones
 - b. In the joints inside of the articular cartilage
 - c. Surrounding the membranes of the joints
 - d. Inside the bones of the joints
2. Immunologic studies of synovial fluid is:
 - a. Microscopic examination.
 - b. X- Ray.
 - c. Complement.
 - d. PCR
3. The integral protein in plasma membrane considered as
 - a. Hormonal receptor.
 - b. Biological Catalyst
 - c. Enzyme Catalyst.
 - d. Channel molecules.



Answer all the following questions

Question 1: Choose the correct answer (one answer only): (10 marks)

1. The key active protein in the clot retraction process is :
a)- plasmin
b)- fibrin
c)- actin
d)- thrombin
2. Christmas disease occurs due to:
a)- deficiency of coagulation factor XI
b)- deficiency of coagulation factor XII
c)- deficiency of coagulation factor IX
d)- deficiency of coagulation factor XIII
3. Pernicious anemia is caused by the loss of:
a)- vitamin B12
b)- gastric parietal cells
c)- iron
d)- vitamin K
4. Lymphocytosis is an increase in the number of :
a)- lymph nodes
b)- lymphocytes
c)- lymphoblasts
d)- lymphomas
5. Genetic defect in hemoglobin synthesis causes:
a)- Hemolytic anemia
b)- Aplastic anemia
c)- Thalassemia
d)- Polycythemia
6. Multiple myeloma is a cancer of:
a)- myeloid DC cells
b)- plasma cells
c)- antibody-producing cells
d)- both b and c
7. Clumping of RBCs following blood transfusion is called:
a)- hemolysis
b)- agglutination
c)- aggregation
d)- hemostasis
8. A person with type AB blood group has AB antigens on RBCs and.....
a)- anti-A Abs in the plasma
b)- no Abs in the plasma
c)- anti-B Abs in the plasma
d)- both types of Abs in the plasma
9. The two coagulation factors that are produced by liver and platelets are :
a)- factors V and XIII
b)- factors VI and XII
c)- factors XI and IX
d)- factors III and IV
10. Polycythemic hyperviscosity occurs due to:
a)- increased numbers of RBCs
b)- decreased RBCs
c)- increased platelets
d)- increased numbers of WBCs

Course title: Biological Fluids (MD503)
First Semester 2022-2023
Time: 2 hours
Total degree: 50



المقرر: علم السوائل البيولوجية (MD503)
الفصل الدراسي الأول 2022-2023
الزمن: ساعتان
الدرجة الكلية: 50

- levels in CSF
4. Cancer affecting serum level of
- a. Chloride.
 - b. Glucose
 - c. Lactate
 - d. Glutamine
5. Gastric juice is a mixture of water and
- a. Hyaluronic Acid, electrolytes and organic substances.
 - b. Carbohydrates and electrolytes
 - c. Glycoprotein and lactose
 - d. HCL and Organic substances
6. Effects of anti-sperm antibodies:
- a. Increased progressive motility
 - b. Increased ability to penetrate egg
 - c. Decreased ability to penetrate cervical mucus
 - d. increased ability to penetrate cervical mucus
7. Synovial fluid characterized by
- a. The fluid pushed through the capillary due to high pressure
 - b. The fluid that leaks around the cells of the capillaries
 - c. The fluid highly lubricant, frictionless film within articulations having a joint cavity
 - d. The fluid accumulates around the visceral organs and wrapped around it
8. LE cells: are present in synovial fluid in patients
- a. With pericardial effusion
 - b. With rheumatoid arthritis
 - c. With Ascites
 - d. With systemic lupus erythematosus
9. Mucin clot test: This test recruit samples from the
- a. Fluid around pericardium
 - b. Fluid around pleural membrane
 - c. Fluid from the osteoarthritic, or traumatic joint
 - d. fluid from the gastric secretions
10. The hormone gastrin is secreted by
- a. Pancreas
 - b. Liver
 - c. Stomach
 - d. Intestine
11. Regulation of gastric secretion three phases:
- a. The gastric phase, the abdominal phase, the intestinal phase
 - b. The gastric phase, the pancreatic phase, the intestinal phase
 - c. The intestinal, the cephalic phase, The colic phase
 - d. The gastric phase, The cephalic phase, The intestinal phase.

Course title: Biological Fluids (MD503)

First Semester 2022-2023

Time: 2 hours

Total degree: 50



المقرر: علم السوائل البيولوجية (MD503)

الفصل الدراسي الأول 2022-2023

الزمن: ساعتان

الدرجة الكلية : 50

12. Pepsinogen is activated by stomach acid into the active protease pepsin, secreted by

- a. Chief cells
- b. G cells
- c. D cells
- d. Goblet cells

13. Microscopic examinations of synovial fluid using EDTA anticoagulant:

- a. Mucin clot test.
- b. Hyaluronic acid.
- c. Cartilage fibrils.
- d. Lipids.

14. Oligozoospermia:

- a. 150 million/ml
- b. <100million/ml.
- c. <20 million/ml.
- d. Due to Estrogen secreting tumors

15. Female patients 45 years was suffering from with severe pain and heart burn by examination she had sever distension and abdominal pain by CBC showed leukocytosis and stool examination was done for her and we found black stool with positive Helicobacter pylori (H.pylori) mention the clinical diagnosis and the type of fluid ?

- a. Heart Failure and transudate fluid
- b. Peptic ulcer and gastric fluid
- c. Tuberculosis with effusion and exudate fluid
- d. Ascites and peritoneal fluid

16. Complete the following

1. It is formed of β -D-N-acetyl glucosamine linked to β -D
2. The Percentage contribution of each of the secretions in seminal fluid
a. 40-80% b.Prostate
3. Prostatic secretion is in appearance rich in and fibrinolysin that are responsible for
4. The test can used for urine examination.
5. Mention the name of each crystals and cells



a. b. c.

انتهت الأسئلة مع تمنياتنا بالنجاح

أ.د/ جمال جمال بدر

أ.د/ نجلاء إدريس

8. Sodium intake should be increased in patients with heart failure.
9. Kwashiorkor occurs due to deficiency of proteins and calories.
10. Essential amino acids can be formed by the body.
11. Cholesterol is found only in animal products.
12. Starch is an example of a complex carbohydrate.
13. Coconut and palm oils are the main sources of polyunsaturated fat.
14. Fluids should be restricted in burns.
15. Several small meals are better than large ones in acute hepatitis.

End of the exam

Good Luck

يرجى الالتزام بكتابة الاختيار الصحيح (a, b, c or d) في الجدول

Part I: Multiple Choice

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
31.	32.	33.	34.	35.					

يرجى الالتزام بكتابة الإجابة الصحيحة (T or F) في الجدول

Part II: True / False

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
11.	12.	13.	14.	15.					

أ.د. رجا حمدى
د. أميرة عبد الحميد

30. Which of the following factors promote calcium absorption?

- a) High dietary phosphate
- b) High protein diet
- c) Excessive alkali intake
- d) Presence of free fatty acid in intestine

31. The most abundant mineral in the body is

- a) Iron
- b) Copper
- c) Calcium
- d) Selenium

32. The protein responsible for transport of iron in blood is

- a) Transferrin
- b) Ferritin
- c) Ceruloplasmin
- d) Albumin

33. In peptic ulcer, patient should avoid:

- a) Highly spiced food
- b) Irritant drugs
- c) Alcohol
- d) All of the above

34. The main extracellular cation is

- a) Magnesium
- b) Sodium
- c) Potassium
- d) Phosphorus

35. Sucrose is

- a) Galactose + fructose
- b) Glucose + galactose
- c) Glucose + fructose
- d) Glucose + glucose

36. Part II: True / False (15 Marks, 1 Mark each):

1. Positive nitrogen balance occurs when nitrogen intake exceeds nitrogen excretion.
2. Potassium is the main intracellular cation.
3. Conn's disease is one of the causes of hyponatremia.
4. About 80% of total body zinc is present in the skin.
5. LDL-C transport cholesterol in blood to liver for breakdown and excretion.
6. Polysaccharides are favored over monosaccharides.
7. Fibers reduce peaks of blood glucose following a meal.

أ.د / رجاء حمدي
د / أميرة عبد الحميد

22. Consumption of raw eggs can cause deficiency of

- a) Biotin
- b) Pantothenic acid
- c) Riboflavin
- d) Thiamin

23. Retinoic acid is important for

- a) Mucin synthesis
- b) Transferrin
- c) Reproduction
- d) All of the above

24. Anti-sterility Vitamin is

- a) Vitamin B1
- b) Vitamin B2
- c) Vitamin E
- d) Vitamin K

25. Niacin is synthesized in the body from

- a) Tryptophan
- b) Tyrosine
- c) Glutamate
- d) Glycine

26. Deficiency of selenium and its dependent enzymes lead to

- a) Hemolytic anemia.
- b) Liver cirrhosis.
- c) Cataract.
- d) All of the above

27. Which of the following is function of zinc

- a) It enters in the formation of bone.
- b) Maintains the myelin within the nervous system
- c) Component of hemoglobin and myoglobin
- d) Anti-inflammatory and hypocholesterolemic

28. Selenium is a constituent of the enzyme:

- a) Glutathione peroxidase
- b) Homogentisate oxidase
- c) Tyrosine hydroxylase
- d) Phenylalanin hydroxylase

29. Which of the following is trace element

- a) Sodium
- b) Phosphorus
- c) Potassium
- d) Selenium

أ.ب.د / رجاء حمدي
د / أميرة عبد الحميد

14. Vitamin -----is essential for synthesis and activation of blood clotting factors

- a) Vitamin C
- b) Vitamin B 12
- c) Vitamin E
- d) Vitamin K

15. Deficiency of vitamin C causes

- a) Scurvy
- b) Pellagra
- c) Pernicious anemia
- d) Beriberi

16. Pantothenic acid is a component of-----

- a) Coenzyme A
- b) Vitamin B1
- c) Vitamin B6
- d) Vitamin B12

17. Biotin is important in

- a) Hydroxylation
- b) Decarboxylation
- c) Carboxylation
- d) Deamination

18. An important function of rhodopsin is

- a) Night vision
- b) Colored vision
- c) Bright vision
- d) Day vision

19. Folic acid deficiency lead to

- a) Night blindness
- b) Scurvy
- c) Beriberi
- d) Spina bifida

20. Riboflavin deficiency causes

- a) Angular stomatitis
- b) Beri beri
- c) Scurvy
- d) Rickets

21. A deficiency of vitamin B 12 causes

- a) Beriberi
- b) Scurvy
- c) Megaloblastic anemia
- d) Rickets

6. **Trans fatty acids are major components of:**
- Sunflower oil
 - Olive oil
 - Corn oil
 - Deep fried foods
7. **Which of the following lead to negative nitrogen balance**
- Trauma
 - Pregnancy
 - Childhood
 - Recovery from an emaciating illness
8. **Which of the following is characteristic of marasmus**
- Enlarged fatty liver
 - Poor appetite
 - Severe muscle wasting
 - Edema is present
9. **Which of the following is used to store insulin in the β cells of the pancreas?**
- Iron
 - Zinc
 - Copper
 - Sodium
10. **One gram of protein produces kcal on complete oxidation in the body**
- 9
 - 7
 - 8
 - 4
11. **Carotene is the precursor of**
- Vitamin A
 - Vitamin B2
 - Vitamin E
 - Vitamin K
12. **The active form of vitamin D**
- 25 hydroxycholecalciferol
 - 1, 25 dihydroxycholecalciferol
 - 24, 25 dihydroxycholecalciferol
 - 1, 24 dihydroxycholecalciferol
13. **Vitamin C enhances absorption of**
- Calcium
 - Phosphorus
 - Iron
 - Zinc

أ.د. / رجا حمد
د / أميرة عبد الحميد



Assiut University

Faculty of Medicine

Medical Biochemistry Department

28-2-2023

Time: 2 hours

Final Exam of Human Nutrition (MD505)

For Faculty of Science Postgraduate Students

Part I: Multiple Choice (35 Marks, 1 Mark each):

1. Deficiency of Vitamin A causes

- a) Pellagra
- b) Hypoprothrombinemia
- c) Megaloblastic anemia
- d) Xerophthalmia

2. Deficiency of vitamin D causes

- a) Rickets and osteomalacia
- b) Tuberculosis of bone
- c) Hypothyroidism
- d) Skin cancer

3. Vitamin B1 coenzyme (TPP) is involved in:

- a) Oxidative decarboxylation
- b) Hydroxylation
- c) Transamination
- d) Carboxylation

4. Which of the following is a fat-soluble vitamin?

- a) Vitamin B6
- b) Vitamin D
- c) Vitamin B12
- d) Vitamin C

5. Active form of folic acid is

- a) Hydroxy folic acid
- b) Methyl folic acid
- c) Tetrahydrofolic acid
- d) Carboxy folic acid

يرجى الالتزام بكتابة الإجابة

الصحيحة في الجدول المخصص

للإجابة في الصفحة الأخيرة

أ.د/ رجا حمدى
د/ أميرة عبد الحميد

- a) 3-5 weeks b) 1-3 weeks
c) 6-12 weeks d) 2-6 weeks
22. Calcium is responsible for:
a) Blood coagulation b) Muscle contraction
c) Heart to beat d) All of the above
23. In typhoid, Widal test detects:
a) O antigen b) H antigen
c) Vi antigen d) Both O and H antigen
24. In what condition would an increased level of serum total protein be expected?
a) Malnutrition b) Renal disease
c) Dehydration d) Hemodilution
25. The normal antistreptolysin O value for adults, which indicates a negative test, is:
a) <200 IU/mL b) >200 IU/mL
c) >150 IU/mL d) <150 IU/mL

Good Luck

Prof. Dr. Nagwa Thabet Abo Elmaali
Dr. Tharwat Mansoure Dr. Amany Abdelrahman

The Answer

First Question

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(21)	(22)	(23)	(24)	(25)					

Second Question

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(21)	(22)	(23)	(24)	(25)					

- a) Kidney
c) Stomach
- b) Lung
d) Liver
9. agents are types of hazardous agents in the lab.
a) Physical and electrical
b) Chemical
c) Biological
d) All of these
10. is the main end product of carbohydrate digestion and provides the energy for the life processes.
a) Vitamins
b) Amino acid
c) Glucose
d) Calcium
11. A raised blood glucose level is called and a low blood glucose level is called
a) hypoglycemia, hyperglycemia
b) hyperglycemia, hypoglycemia
c) hypoglycemia, goat disease
d) goat disease, hyperglycemia
12. Uric acid is a chemical substance that is created due to the breaking down of inside the human body.
a) Vitamins
b) Amino acids
c) Glucose
d) Purines
13. Among the causes of hypercalcemia:
a) Vitamin D deficiency
b) Large intake of vitamin D
c) Hypoparathyroidism
d) Intestinal malabsorption
14. "H" antigen is a
a) Somatic antigen
b) Flagella antigen
c) S. Paratyphi (AH) antigen
d) S. Paratyphi (BH) antigen
15. Protein concentration is measured using biuret method at:
a) 660 nm
b) 330 nm
c) 546 nm
d) 578 nm
16. In what condition would a decreased level of serum total protein be expected?
a) Renal Failure
b) Increase in the concentration of specific proteins
c) Hemoconcentration
d) Hemodilution
17. A low blood urea level may be found in:
a) Dehydration
b) Gastrointestinal blood loss
c) Pregnancy
d) Diuretic therapy
18. Antistreptolysin O test is used for the diagnosis for:
a) Rheumatic fever
b) Rheumatic arthritis
c) Typhoid fever
d) Enteric fever
19. The normal value of total protein for adults is:
a) 8.5-10.2 mg/dL
b) 6.6-8.3 g/dL
c) 3.6-7.7 mg/dL
d) 2.5-6.8 mg/dL
20. The absorbance of which calcium concentration is being measured using Arsenazo III:
a) 660 nm
b) 505 nm
c) 520 nm
d) 578 nm
21. The antibodies level of antistreptolysin O starts to rise in after streptococcal infection.

and serological test. ()

17. Proteins in the blood are classified into two kinds, albumin and globulin. ()
18. Hypercalcemia is a condition in which the calcium level in your blood is below normal. ()
19. Urea is the main product of protein breaking down. ()
20. AIDS can be diagnosed with the Widal test. ()
21. Proteins give an intensive violet-blue complex with copper salts in an acidic medium. ()
22. Urea levels are affected by several factors including hydration state and dietary intake. ()
23. An antistreptolysin titer, greater than 100 IU/ml is considered a positive test in adults. ()
24. Calcium reacts with Arsenazo III, at neutral pH, yields a green colored complex. ()
25. The causative agent of typhoid is Salmonella typhi. ()

II- Choose the correct answers:

(25 mark)

1. Rheumatoid factor activity can be detected by various laboratory methods such as
 - a) Nephelometry
 - b) Fluorimetry
 - c) Radioimmunoassay
 - d) All of these
2. Insulin is the most important hormone that regulates the amount ofin the blood?
 - a) Calcium
 - b) Nitrogen
 - c) Glucose
 - d) Uric acid
3. Serum uric acid is mainly measured to investigate..... disease and may be an indication of renal insufficiency.
 - a) Goat
 - b) Rheumatoid
 - c) Sugar
 - d) Liver
4. hazards are samples have pathogens harmful to human and animal that can be transmitted via dealing with blood-fluids-urine Cells and others.
 - a) Physical
 - b) Chemical
 - c) Biological
 - d) All of these
5. The physiological role ofis to bind to phosphocholine on microbes and damaged cells and enhance phagocytosis by macrophages.
 - a) CRP
 - b) RF
 - c) Urate
 - d) All of these
6. Levels of rheumatoid factor in the blood are most often associated with autoimmune diseases such as rheumatoid arthritis.
 - a) Low
 - b) High
 - c) Medium
 - d) Reduced
7. Elevated uric acid level may be an indication of renal insufficiency is commonly associated with gout and also is found in
 - a) Leukemia, polycythemia
 - b) Familial idiopathic hyperuricemia
 - c) Conditions associated with decreased renal function
 - d) All of these
8. C- reactive protein (CRP) is an acute- phase protein found in the blood stream, and it is synthesized by the



Faculty of Science
Chemistry Department

Feb. 25, 2023
Time: 2 hours

1st Semester Final Exam for the Professional Diploma in Biochemistry Students
Chem-505 Practical Biochemistry I

ملحوظة هامة: الإمتحان مكون من (4) صفحات، يرجى الإجابة بالجدول الموجود في الصفحة رقم (4)

Answer the following questions:

(50 marks)

I – Write (true) or (false) in front of the following statements:

(25 mark)

1. The blood glucose is measured mainly in case of the management of diabetes mellitus that is related to the deficiency of insulin action or secretion causing a rising in blood glucose and depression of glucose metabolism in the tissues. ()
2. Studying biosafety is to reduce the potential exposure of the laboratory worker, persons outside of the laboratory, and the environment to potentially infectious agents. ()
3. Turn on gas, water before leaving and don't run in the lab are indication to the biosafety level. ()
4. Indication of a negative result for CRP level is observed when an agglutination of the latex particles' suspension occurs. ()
5. When the body doesn't need energy, glucose is stored in the liver in form of glycogen that can be converted into glucose through glycolysis. ()
6. No need for biological safety cabinets (BSCs) in biosafety equipment level 1. ()
7. In good microbiological techniques, keep work places clean and free of wanted chemicals, biological specimens. ()
8. The solubility of uric acid in water is high. ()
9. A raised blood glucose level is called hyperglycemia which may accompany pancreatic disease and some endocrine disorders such as thyrotoxicosis and Cushing's syndrome. ()
10. Uric acid exists mainly as urate where urate concentration becomes high in blood, uric acid crystal formation increases. ()
11. To get high biosafety, use unlabeled bottle and pipetting by mouth. ()
12. CRP test can be used to diagnose a specific disease. ()
13. A rheumatoid factor test measures the amount of rheumatoid factor in your blood. ()
14. Normal values of urea in plasma is 40-180 mg/dL. ()
15. High levels of calcium are found in hypo-parathyroidism. ()
16. Laboratory diagnosis of enteric fever includes blood culture, stool culture ()

* A researcher wishes to see whether there is any difference in the weight gains of athletes following one of three special diets. Athletes are randomly assigned to three groups and placed on the diet for 6 weeks. At $\alpha=0.05$, can the researcher conclude that there is a difference in the diets?

The weight gains (in pounds) are shown in the following table:

Diet A	Diet B	Diet C
3	10	8
6	12	3
7	11	2
4	14	5
	8	
	6	
$\bar{X}_1 = 5.0$	$\bar{X}_2 = 10.167$	$\bar{X}_3 = 4.5$
$S_1 = 1.826$	$S_2 = 2.858$	$S_3 = 2.646$

Applying the ANOVA method: [answer questions (21-25)]

21-- The sum of squares between treatments (SSB) is equal:

- a) 104.80 b) 264.93 c) 101.095

22-- The mean square between treatments (MSB) is equal:

- a) 50.548 b) 8.73 c) 88.80

23-- The sum of squares within treatments (SSW) is equal:

- a) 71.833 b) 264.93 c) 160.13

24-- The mean square within treatments (MSW) is equal:

- a) 80.07 b) 6.530 c) 88.8

25-- At $\alpha=0.05$, test the hypothesis H_0 that there is no differences among the three treatments, will concluded to:

- a) Cannot reject H_0 b) Reject H_0

You may use the tabulated values

$$\chi^2_{0.05,14} = 6.571, \chi^2_{0.95,14} = 23.685, t_{0.975,10} = 2.23, t_{0.95,12} = 1.78$$

$$\Phi(1.0) = P(-\infty < Z < 1.0) = 0.8413, \Phi(1.27) = P(-\infty < Z < 1.27) = 0.8980,$$

$$\Phi(1.9) = P(-\infty < Z < 1.9) = 0.9713, Z_{0.99} = 2.33, Z_{0.975} = 1.96, Z_{0.995} = 2.58,$$

$$Z_{0.95} = 1.65, F_{0.95,2,11} = 3.98$$

Answer Table

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25					

Best Wishes Professor Mohamad Adel & Professor Zeinhum Jaheen

* A sample of 15 items provides a sample standard deviation of 11.2,
[answer ques. (9-11)]:

9-- The 90% confidence interval for the population standard deviation σ is:

- a) (8.611, 16.348) b) (79.44, 286.349) c) (74.146, 267.259)

Considering the following hypothesis:

$$H_0: \sigma^2 = 126 \quad VS \quad H_1: \sigma^2 \neq 126$$

10-- The value of the test statistic is equal:

- a) 14.933 b) 13.938 c) 14.062

11-- At $\alpha=0.1$, the conclusion and your decision is:

- a) Reject H_0 b) Cannot reject H_0

The following data of two independent random samples taken from two normal populations with equal variances: [answer questions (12-15)]

Sample 1	25	75	38	41	27	32
Sample 2	57	25	38	14	10	29

12-- The two sample means are equals:

- a) $\bar{X}_1 = 28.8, \bar{X}_2 = 40.2$ b) $\bar{X}_1 = 29.3, \bar{X}_2 = 39.7$ c) $\bar{X}_1 = 39.7, \bar{X}_2 = 28.8$

13-- The two sample standard deviations are equals:

- a) $S_1 = 18.4, S_2 = 17.1$ b) $S_1 = 19.2, S_2 = 18.4$ c) $S_1 = 17.1, S_2 = 19.2$

Considering the following hypothesis:

$$H_0: \mu_1 = \mu_2 \quad VS \quad H_1: \mu_1 \neq \mu_2$$

14-- The calculated T test is equal

- a) $T_{cal} = 0.25$ b) $T_{cal} = 1.06$ c) $T_{cal} = 2.60$

15-- At $\alpha=0.05$, the conclusion and your decision is:

- a) Reject H_0 b) cannot reject H_0

* The pulse rates for 13 adult women were as follows:

83 58 70 56 76 64 80 76 70 97 68 78 108

[answer ques. (16-20)]:

16-- The point estimate of the population mean is equal:

- a) 78.45 b) 76.5 c) 75.69

17-- The point estimate of the population standard deviation is equal:

- a) 75.69 b) 14.54 c) 211.41

18-- The 90% confidence interval for the population variance σ^2 is:

- a) (68.50, 82.88) b) (69.00, 83.10) c) (83.10, 69.00)

Considering the following hypothesis:

$$H_0: \mu = 75 \quad VS \quad H_1: \mu \neq 75$$

19-- The value of the test statistic is equal:

- a) 17.01 b) 0.17 c) 1.70

20-- At $\alpha=0.1$, the conclusion and your decision is:

- a) Reject H_0 b) Cannot reject H_0

الجموعة	الرقم الجامعي	إسم الطالب

Faculty of Science		Final Exam 2022-2023
Mathematics Department	Biostatistics (MS504)	Time: Two Hours

Choose the correct Answer:

(2 marks per each)

Remark: Please approximate your answer to the given degree

* A doctor knows from experience that 10% of the patients to whom he gives a certain drug will have undesirable side effects. For the 10 patients to whom he gives the drug, Find the probabilities that: (Answer questions (1-3))

1. At most two patients will have undesirable side effects.
a) 0.9300 b) 0.0700 c) 1.0
2. Four patients will have undesirable side effects
a) 0.0014 b) 0.0112 c) 0.9889
3. At least two patients will have undesirable side effects
a) 0.7360 b) 0.6045 c) 0.2640

* A research scientist reports that mice will live an average of 40 months when their diets are sharply restricted and then enriched with vitamins and proteins. Assuming that the lifetimes of such mice are normally distributed with a standard deviation of 6.3 months. Find the probabilities that:

(Answer questions (4-6))

4. A randomly selected mouse will live more than 32 months equals
a) 0.8980 b) 0.1020 c) 1.0
5. A randomly selected mouse will live less than 28 months equals
a) 0.9713 b) 0.0287 c) 0.5
6. A randomly selected mouse will live between 33.7 and 46.3 months equals
a) 0.3174 b) 0.6915 c) 0.6826

* A dietitian claims that 60% of people are trying to avoid Trans fats in their diets. 200 people are randomly selected and found that 128 people stated that they were trying to avoid Trans fats in their diets.

7-- The 95% confidence interval for the population proportion p is:

- a) (0.5734, 0.7065) b) (0.1734, 0.2065) c) (0.600, 0.6400)

8- At $\alpha = 0.01$, test the hypothesis $H_0: p = 0.6$ VS $H_1: p \neq 0.6$

- a) Reject H_0 b) Cannot reject H_0

Assiut University, Faculty of Science

Biochemistry diploma

Time allowed: 2hrs
(B520)

50 marks



Final exam, 06 - 07 - 2023

2nd semester, 2023

Advanced Molecular Biology

Question I: Choose the correct answer (1 mark for each)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25					

Question II: Mark the true sentences with (T) and false sentences with (F).
(1 mark for each)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25					

End of Questions-Good luck

19- Which enzyme is incorrectly matched to its function? (A) RNA polymerase – transcription (B) aminoacyl-tRNA synthetase – Poly A Tail (C) peptidyl transferase -- translation (D) DNA ligase -- joins Okazaki fragments	20- Which one of the following is not a kind of RNA? (A) tRNA (transfer RNA) (B) mRNA (messenger RNA) (C) rRNA (ribosomal RNA) (D) All of the above are kinds of RNA
21- Transfer RNA molecules bring amino acids to the _____. (A) nucleus (B) endoplasmic reticulum (C) ribosomes (D) plasma membrane	22- The steps in polypeptide synthesis include _____. (A) initiation (B) elongation (C) termination (D) all of the above
23- Most procaryotic proteins begin with this modified amino acid. (A) N-formylleucine (B) N-formylmethionine (C) N-formylserine (D) N-formylproline	24- In transcription, the nucleotide sequence CAT in DNA would specify -----in mRNA. (A) TAC (B) GTU (C) GAU (D) GUA
25- The genetic code consists of groups of three nucleotides called. (A) introns (B) codons (C) anticodons (D) reading frames	

II-Mark the true sentences with (T) and false sentences with (F). (1 mark for each)

1- Semiconservative replication means that the parental DNA strands serve as templates for the synthesis of the new progeny DNA strands.	2- All types of topoisomerases enzymes need ATP for action.
3- A 5-to-3 synthesis of DNA means that growth occurs by addition of dNTPs to the exposed 3-OH group.	4- Purines and pyrimidines form glycosidic linkage with the pentose sugar at the N1 position.
5- It is easy to break the bond between A and T than in between G and C.	6- Polymerization of dNTP by DNA polymerase is in 3' → 5' direction.
7- DNA always carries the genetic information for all organisms.	8- Positive supercoils of DNA releasing the torsional pressure or unwinding the helix.
9- Single –strand binding proteins at the replication fork hold the two strands of a DNA apart by covering the bases and thus preventing base pairing.	10- Terminal deoxynucleotidyl transferase is a specialized DNA polymerase which has both template-independent and template-dependent activities.
11- 3' → 5' exonuclease activity enables DNA pol 1 to remove RNA primer.	12- In the same DNA double helix, small writhing number results in large twisting number.
13- Exonuclease produce fragments of DNA molecules.	14- RNA polymerases do not need a primer to work.
15- Origin of replication (ORI) is reach in AT nucleotides.	16- Topoisomerase type Ib is MgeI ₂ dependent.
17- The first nucleotide of RNA primer terminates in 5' triphosphate.	18- Just as one amino acid may be specified by more than one codon, one codon may specify more than one amino acid.
19- Genes are composed of segments of "extra," nonessential materials called exons.	20- During translation, the order of the codons in mRNA determines the order of the amino acids in a polypeptide.
21- The sugar found in RNA is called deoxyribose	22- The process of translation occurs at the ribosome
23- The job of mRNA is to pick up amino acids and transport them to the ribosomes.	24- Eukaryotic mRNAs have a 7-methylguanosine cap on their 3' end
25- Alternative splicing allows for more than one protein to be produced from a single gene.	End of Questions-Good luck.

**I- Choose the correct answer** (1 mark for each)

1- In prokaryotes, during replication, the RNA primer is removed by a. RNA polymerase b. DNA polymerase I c. DNA polymerase III d. DNA polymerase β	2- Which of the following is known to relax supercoiled DNA? a. Endonuclease b. Helicase c. Ligase d. Topoisomerase
3- DNA which is wrapped around 4 pairs of histonic protein is termed a- nucleosome b- leucine c- nucleotide d- methionine	4- DnaA protein has an important role in initiation of a- DNA replication b- transcription c- translation d- all of the mentioned
5- In which carbon do the deoxyribonucleotides lack an -OH molecule? a. C1 b. C2 c. C3 d. C4	6- How many origin of replication are present in the <i>E. coli</i> genome a. 1 b. 100 c. 1000 d. Uncountable
7- Which of the following is a component of the nucleic acid backbone? a. Nitrogenous base b. Pentose sugar c. Amino acid d. Hydrogen base	8- 6 nucleosomes are packing together to form a. Chromatid b. Chromosome c. Solenoid d. DNA
9- Reverse transcriptase is polymerase. a- DNA-dependent DNA b- RNA-dependent RNA c- DNA-dependent RNA d- RNA-dependent DNA	10- Telomere structure protects DNA from activity. a- endonuclease b- exonuclease c- polymerase d- telomerase
11- Primase is belonging to..... a- DNA polymerases b- RNA polymerases c- helicases d- exonucleases	12- Telomerase is a complex enzyme, where..... Bind(s) to the TTAGGG sequences in the single strand telomeric DNA a- TRF1 b- POT1 c- TRF2 d- TN2 and TPP1
13- is the total number of turns of the DNA double helix. a- the linking number b- the twisting number c- the writhing number d- the supercoil	14- Which of the following is DNA dependent RNA polymerase? a- DNA polymerase b- RNA polymerase c- reverse transcriptase d- RNA replicase
15- Which of the following is correct for endonucleases? a- end specific b- produce respective nucleotides c- act on single strand DNA d- all answers are incorrect	16- is the DNA supercoiling in the same direction as the intrinsic winding of the double helix. a- Linking number b- twisting number c- positive supercoil d- negative supercoil
17- In messenger RNA, the nucleotide series UAG specifies. (A) arginine (B) serine (C) stop (D) proline	18- The direct result of transcription is: (A) a duplicate DNA molecule (B) a protein (C) nRNA (D) mRNA

Course: Biomedical markers
Course code: MD504

Final exam (June 2023)

دبلوم الدراسات العليا المهنية في الكيمياء الحيوية
Time: Two hours

10. Troponins are superior markers for diagnosing myocardial infarction than other markers.
11. Myoglobin is a sensitive but not specific cardiac marker.
12. Hypoalbuminemia is specific to liver diseases with no other causes.
13. Bone markers testing can detect response to bone formation therapies in a shorter time than bone density X-ray testing.
14. Most bone markers will be the highest during night.
15. Bone markers reference intervals are fixed for age and sex.
16. Bone markers tests are diagnostic of the cause of bone resorption.
17. Liver and egg yolk are rich sources of vitamin D3 itself.
18. Symptoms of vitamin D deficiency include bone pain and muscle weakness.
19. Cancer can cause hypocalcemia by many mechanisms.
20. Chronic renal failure should be regularly monitored by PTH testing.

MCQ answers:

1		11		21	
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

True or False answers:

1		11	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		20	

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21. Both CK and troponins appear after myocardial infarction within:

- a. 1 – 2 hours
- b. 2 – 4 hours
- c. 4 – 8 hours
- d. 8 – 12 hours

22. The earliest cardiac marker that appears in blood after myocardial infarction is:

- a. Creatine kinase & Troponins
- b. Myoglobin
- c. AST
- d. LDH

23. Vitamin D toxicity occurs due to:

- a. Excess dietary intake
- b. Too much sun exposure
- c. Defective excretion
- d. Too much vitamin D drug supplement

24. Which of the following LDH isoenzymes are specific to cardiac muscles?

- a. LDH1 & LDH2
- b. LDH2 & LDH3
- c. LDH3 & LDH4
- d. LDH4 & LDH5

25. The recommended marker for bone resorption (by the International Osteoporosis Foundation) is:

- a. Deoxypyridinoline
- b. Pyridinium Crosslinks
- c. C-telopeptide of type I collagen
- d. Procollagen type I N-terminal propeptide

26. The organs involved in activation of vitamin D into the active form (Calcitriol) are:

- a. Skin and liver
- b. Skin and kidney
- c. Liver and kidney
- d. Intestine and skin

14. Which of the following is true concerning proteinuria?

- a. Microalbuminuria can detect initial stages of renal impairment.
- b. Frank proteinuria occurs when it is greater than 30 mg/ day.
- c. Proteinuria is best evaluated by albumin/ creatinine ratio in spot urine.
- d. Proteinuria is seen in chronic kidney diseases only.

15. The enzyme creatine kinase is:

- a. Composed of 2 polypeptide chains and have 3 isoenzymes
- b. Composed of 3 polypeptide chains and have 3 isoenzymes
- c. Composed of 3 polypeptide chains and have 4 isoenzymes
- d. Composed of 4 polypeptide chains and have 5 isoenzymes

16. Vitamins C, E and selenium decrease the risk for cardiovascular diseases by:

- a. Decreasing LDL level
- b. Decreasing total cholesterol level
- c. Decreasing Triglycerides level
- d. Inhibiting oxidation of LDL

17. The creatine kinase isoenzyme found mostly in cardiac muscles is:

- a. CK-1
- b. CK-2
- c. CK-3
- d. CK-4

18. A cardiac marker with high specificity is characterized by:

- a. Abundant in cardiac tissue
- b. Absent from non-myocardial tissue
- c. Rapid release
- d. Long half life in blood

19. Which of the following is associated with decreased risk of cardiovascular diseases?

- a. High Total cholesterol
- b. High LDL – cholesterol
- c. High HDL – cholesterol
- d. High Triglycerides

20. The enzyme lactate dehydrogenase is:

- a. Composed of 2 polypeptide chains and have 3 isoenzymes
- b. Composed of 3 polypeptide chains and have 3 isoenzymes
- c. Composed of 3 polypeptide chains and have 4 isoenzymes
- d. Composed of 4 polypeptide chains and have 5 isoenzymes

7. Which of the following is an example of an oncogene?
 - a. BRCA1
 - b. P53
 - c. RB1
 - d. ras
8. Which of the following is a prerenal cause of renal disease?
 - a. Glomerulonephritis
 - b. Hypertensive nephropathy
 - c. Severe blood loss
 - d. Prostatic cancer
9. The normal serum creatinine level is:
 - a. 15 – 45 mg/ dl
 - b. 0.6 – 1.2 mg/ dl
 - c. 2.8 – 4 mg/ dl
 - d. 3.5- 5 mg/ dl
10. Which of the following is a test for glomerular function?
 - a. Serum urea
 - b. Urine concentration test
 - c. Dilution test
 - d. Acidification test
11. The normal serum calcium level is:
 - a. 8.8 – 10.2 mg/ dl
 - b. 2.6 – 6 mg/ dl
 - c. 136 – 146 mEq/ L
 - d. 101 – 109 mEq/ L
12. Which of the following changes in serum analytes occurs in chronic kidney diseases?
 - a. Hyponatremia
 - b. Hypokalemia
 - c. Hypophosphatemia
 - d. Hypochloremia
13. Chronic renal failure patients usually suffer from anemia due to:
 - a. Increased hemolysis
 - b. Decreased iron levels
 - c. Decreased erythropoietin levels
 - d. Excessive hematuria

Multiple Choice Questions (30 Questions – 1 mark each):

1. Which of the following is an example of tissue and organ specific antigens?
 - a. Thyroglobulin
 - a. AFP
 - b. CEA
 - c. LDH
2. Which of the following is used for monitoring of Hepatocellular carcinoma?
 - a. AFP
 - b. PTH
 - c. LDH
 - d. hCG
3. An oncofetal antigen that is used for monitoring of colorectal cancer and show higher levels in smokers:
 - a. AFP
 - b. CEA
 - c. hCG
 - d. Tissue polypeptide antigen (TPA)
4. Which of the following is used for monitoring of pancreatic cancer and bile ducts cancer:
 - a. CA.19- 9
 - b. CA. 72-4
 - c. CA.15-3
 - d. β 2-microglobulin
5. β 2 microglobulin can be used for monitoring of:
 - a. Lymphoma
 - b. Brain cancer
 - c. Pancreatic cancer
 - d. Ovarian cancer
6. In a case of a suspected testicular tumor, which of the following can be used as a tumor marker to help the diagnosis?
 - a. PTH
 - b. PSA
 - c. AFP
 - d. CA19.9

Choose the correct answer A, B, C, or D.

(1 marks for each question)

21. Stable and irreversible interactions between proteins, called monomers. Monomers alone do not have a function but by interacting they have it.
 (A) Homo-oligomer interactions (B) Non-obligate interactions
 (C) Permanent interactions (D) None of previous
22. The structure formed by the union of two or more peptide chains into a so-called protein unit is called
 (A) Primary structure (B) Secondary structure
 (C) Tertiary structure (D) Quaternary structure
23. A technique used to study interactions between proteins saves time and cost but is not accurate enough
 (A) In vivo technique (B) In vitro technique
 (C) In silico technique (D) None of previous
24. X-ray has many advantages like
 (A) Examine solutions (B) Determine secondary structure
 (C) Direct image construction (D) Closer to biological conditions
25. First life sciences website operated by the Swiss institute of bioinformatics (SIB)
 (A) GenBank (B) Expasy (C) PubMed (D) PDB
26. Bioinformatics tools are used to biological data
 (A) storage (B) Organize
 (C) analyze (D) all previous

Part 2 answers

Question	1	2	3	4	5	6	7	8	9	10	11	12	13
Answer													
Question	14	15	16	17	18	19	20	21	22	23	24	25	26
Answer													

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Prof. Dr. Ahmed Maher

Dr. Shaimaa Azoz

Page 4 of 4

Part 2 (26 degrees)

Put T for true and F for false: (1 mark for each question)

1. Biological databases contain several types of scientific information comes only from laboratory experiments. ()
2. MEGA is an integrated tool for conducting automatic and manual sequence alignment and inferring phylogenetic trees. ()
3. PPIs play important role in metabolic pathways ()
4. Sequence based approaches is a method to study proteins interactions via computer simulations ()
5. Y2H relies on expression of a reporter gene which activated by binding a particular transcription factor ()
6. *In vitro* technique is a given procedure is performed on the whole living organism itself. ()
7. NMR technique use atomic nuclei and their resonance emission under magnetic conditions ()
8. Sections of DNA known as genes are used to make proteins and other molecules that help the cell to carry out its specific functions. ()
9. Each database entry is described by unique accession number and the data is structured in tables or easy-treatment frameworks. ()
10. Yeast 2-hybrid assay occurs in cells, so it needs biochemicals purification ()
11. UnProtKB/TrEMBL have a high levels of manual curations entries ()
12. Primary database is original biological data submitted by scientific community ()
13. It has been revealed that over 80% of proteins do not operate alone but in complexes ()
14. FASTA is easy to parse, so it become hugely popular and the default input format for much sequence analysis software ()
15. Bioinformatics tools are software programs that are designed for extracting the meaningful information from biological databases. ()
16. Proteins are interacted with other proteins and RNA only ()
17. Swiss-prot is created to save time that the traditional time- and labour-intensive manual curation process ()
18. Proteomics is the comprehensive study of little classes and types of proteins ()
19. RasMol is bioinformatics tool has used to find regions of local similarity between sequences and calculate statistical significance of matches ()
20. Protein data bank (PDB) is specialized database ()

٨- يعد تصميم البوادي Primer design من ضمن

- أ. مهام المعلوماتية الحيوية
- ب. وسائل المعلوماتية الحيوية
- ت. محاور المعلوماتية الحيوية

٩- تطوير الخوارزميات والبرامج والاحصائيات لتحديد العلاقات بين البيانات في حالة المجاميع الكبر من ضمن:

- أ. أساسيات المعلوماتية الحيوية
- ب. وسائل المعلوماتية الحيوية
- ت. محاور المعلوماتية الحيوية

١٠- قواعد البيانات الإضافية تكون ضرورية ل

- أ. عملية الفيرسه Indexing
- ب. توصيف البروتينات
- ت. توصيف البيانات المخزونة

١١- الابداع المتكرر لتواليات متشابهة او متداخله من قبل الباحث نفسه او من قبل باحثين مختلفين من ضمن:

- أ. أساسيات قواعد البيانات الشخصية
- ب. المعوقات المتعلقة بقواعد البيانات الشخصية
- ج. المهام الأساسية لقواعد البيانات الشخصية

١٢- تنقيح التهميشات وإعادة صياغتها تعتبر من ضمن

- أ. المعوقات المتعلقة بقواعد البيانات الحيوية
- ب. المهام الأساسية لقواعد البيانات
- ج. كل ما سبق

إجابات الجزء الاول

السؤال	١	٢	٣	٤	٥	٦	٧	٨	٩	١٠	١١	١٢
الاجابة												

Answer

Question

Answer

Question

Answer

Question

Answer

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Answer

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Answer

Question

Answer

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Prof. Dr. Ahmed Maher

Dr. Shaimaa



كلية العلوم جامعة أسيوط	امتحان نهائي الفصل الدراسي الثاني ٢٠٢٢-٢٠٢٣ م	دبلوم الدراسات العليا المهنية في الكيمياء الحيوية
اسم المقرر: المعلوماتية الحيوية (MC525)	الدرجة: ٥٠ درجة	الزمن: ساعتان
التاريخ: ٢٠٢٣/٦/١٧ م		



الجزء الأول (٢٤ درجة)

اختر الإجابة الصحيحة واكتبها في الجدول التالي لكل من: (درجتان لكل سؤال)

- ١- قواعد بيانات swiss-2Dpage التابع الى المركز السويسري يعتبر من ضمن:
أ. قواعد بيانات المصفوفات الدقيقة
ب. قواعد بيانات الترحيل الكهربائي
ت. قواعد البيانات الخاصة بالمسارات الايضية
- ٢- يوفر نظام الاسترجاع التابع للمركز الأوروبي EBI مواقع مهمة مثل
أ. توفير روابط الى قواعد بيانات اخرى
ب. توفير مدخلا للمسارات الايضية والجينومات الكاملة
ت. كل ما سبق
- ٣- تطوير الأدوات والمصادر التي تساعد في تحليل البيانات تعتبر من:
أ. مهام المعلوماتية الحيوية
ب. محاور المعلوماتية الحيوية
ت. وسائل المعلوماتية الحيوية
- ٤- قواعد بيانات للتنبؤ ب miRNA تعتبر من ضمن:
أ. قواعد البيانات الخاصة بالبروتينات
ب. قواعد البيانات الخاصة ب RNA
ت. قواعد البيانات الخاصة بتصنيف البروتينات
- ٥- PIR تعتبر من قواعد:
أ. بيانات البروتينات
ب. بيانات خاصة بالمراجع
ت. بيانات خاصة بالتصنيف
- ٦- يعتبر موقع الصحة العالمية WHO المسمى HINARI من ضمن قواعد البيانات الخاصة ب:
أ. المراجع
ب. التصنيف
ت. الايض والانزيمات
- ٧- إيجاد القطيفات Motifs تعتبر من:
أ. مهام المعلوماتية الحيوية
ب. وسائل المعلوماتية الحيوية
ت. محاور المعلوماتية الحيوية



Question 1: Fill in the following sentences

(25 marks)

1. Digestion of ingested microbes by enzymes occurs within
2. TB bacilli is a type of bacteria causing
3. is an inherited deficiency in the production of one of several subunits of NADPH oxidase.
4. is an enzyme in saliva and tears and acts as a natural substance that hydrolyzes bacterial cell wall.
5. Arginine depletion was ascribed as in cancer treatment for arginine auxotrophic tumors, hence the enzyme is used as such treatment.
6. is seen in the inner membrane of mitochondria and is the predominant glutamine-using enzyme in the brain.
7. enzyme is used for the treatment of acute lymphoblastic leukemia.
8. Skin Ulcer is an open wound that develops on the skin as a result of injury, poor circulation, or pressure. Hence, enzyme can be used as a treatment for the hydrolysis of
9. enzyme is employed in medicine to increase drug diffusion and reverse the effects of HA filler injections and is also used to inhibit viral replication.
10. is an enzyme that converts plasminogen to plasmin and is used for medical treatment of myocardial infarction.
11. Once CTLs recognize the target cells they produce toxic proteins such as and which penetrate the target cell through the holes and activates
12. is congenital perforin deficiency and is considered a rare cause of human immunopathology and immune dysregulation.
13. is characterized by cellular swelling caused by a failure in ion transporter function.
14. Lack of apoptosis in humans can lead to webbed fingers phenomenon called
15. Most of the functional plasma enzymes are synthesized in the
16. and are examples of non-functional plasma enzymes, and their substrates are in the plasma.
17. Lipase enzyme is used for the diagnosis of
18. is used for the diagnosis of metastatic carcinoma of the prostate, while phosphatase (alkaline) is used for the diagnosis of

انتهت الأسئلة مع تمنياتنا بالنجاح

أ.د/ جمال جمال بدر
أستاذ المناعة - كلية العلوم - جامعة أسيوط

4- Elevation of non- plasma enzymes due to.....

- a. tissue injury & necrosis b. obstructive processes c. abnormal rate of synthesis d. All are true

25- Enzymes assay usually carried out for the diagnosis of myocardial infarction are.....

- a. CPK b. AST c. LDH d. All are true

II- Indicate whether the sentence is true (T) or false (F) (12.5 Marks)

- 1- Inhibition of HMG-CoA reductase by cholesterol is example for feedback inhibition. ()
- 2- Anti cancer drugs as competitive inhibitors are useful chemotherapeutic agents. ()
- 3- Enzyme assays measure either the consumption of substrate or production of product over time. ()
- 4- Blank solution contains everything except the compound to be measured. ()
- 5- In discontinuous assay of ALT, addition of 2,4-dinitrophenylhydrazine (DNPH) stops the reaction and forms the 2,4-dinitrophenylhydrazone measured at 360nm. ()
- 6- Glucose oxidase enzyme (EC number 1.1.3.4) is an oxidoreductase that catalyses the oxidation of glucose to hydrogen peroxide and D-glucono- δ -lactone. ()
- 7- Thyroid peroxidase oxidizes iodide ions to form iodine atoms for addition onto tyrosine residues on thyroglobulin for the production of T_4 and T_3 . ()
- 8- Cytochromes P450 (CYPs) are a superfamily of enzymes containing heme as a cofactor that function as monooxygenases in mitochondria. ()
- 9- Protein kinase C is activated by signals such as increases in the level of DAG or Ca^{2+} . ()
- 10- Carbonic anhydrase plays an important role in respiration and maintained blood pH 7.4 by influencing CO_2 transport in the blood. ()
- 11- Enzyme inhibitors are substances which alter the catalytic action of the enzyme and consequently slow down, or in some cases, stop catalysis. ()
- 12- Non-plasma specific enzymes are either absent or present in low concentrations in plasma. ()
- 13- In the liver ALP is attached to biliary canicular and sinusoid membranes of the hepatocytes, decreased ALP level is usually associated with blockage of the bile ducts. ()
- 14- Amylase is used clinically in the diagnosis of pancreatic disorders. ()
- 15- Serum lipase and amylase level in peritoneal fluid were used to differentiate between acute pancreatitis and other abdominal disorders. ()

11-Digestive enzymes breakdown ingested food molecules by.....

- a. Oxidation b. Hydrolysis c. Reduction d. Conjugation

12-Pepsin is example for which class of enzymes?

- a. Hydrolases b. Ligases c. Oxidoreductases d. Lyases

13-Name the enzyme which catalyzes the oxidation-reduction reaction?

- a. Transaminase b. Glutamine synthetase c. Phosphofructokinase d. Oxidoreductase

14-In continuous assay of ALT the absorbance at 340nm is measured each minute without stopping the reaction, resulting in decreased readings due to.....

- a- oxidation of NADH b. oxidation of NADPH c. reduction of NADH d. reduction of NADPH

15- Classification of enzymes has been recognized by.....

- a- International Union of Physiology b- International Union of Biochemistry
c- International Union of Biotechnology d-International Union of Genetic Engineering

16-19-.....is used as a marker to detect acute pancreatitis.

- a) amylase b) acid phosphatase c) γ glutamyltransferase d) Creatine kinase

17-.....is used as a marker to detect myocardial infarction

- a) LDH b) Creatine kinase c) AST d) All of these

18- Which of the following can be used to determine the rate of enzyme-catalyzed reactions?

- a. rate of disappearance of the enzyme b. rate of disappearance of the substrate
c. rate of disappearance of the product d. change in volume of the solution

19- What is the process called by which proteins lose their shape and function?

- a. Denaturation b. Hydrolysis c. Deamination d. Transamination

20- Pepsin is examples for which class of enzymes.

- a. hydrolases b. ligases c. oxidoreductases d. lyases

21- The coenzyme is basically a

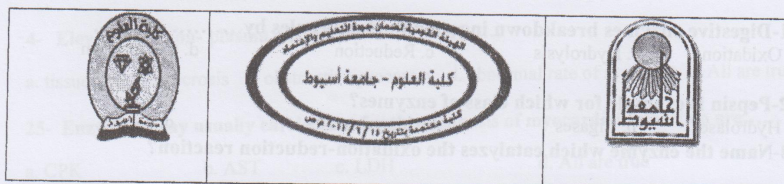
- a. protein b. carbohydrate c. vitamin d. none of these

22- The first enzyme to mix with food in the digestive tract is.....

- a. pepsin b. cellulose c. amylase d. trypsin

23- Which of the following organ expresses glucokinase?

- a. Kidney b. Muscle c. Liver d. Brain



Biochemistry Diploma

Second semester 20/6/2023

Enzymology (C503) Exam

Period of Exam 2 hours

I-Choose the correct answer (12.5 marks)

- 1-The general mechanism is that an enzyme acts by.....
a. ↓ activation energy b. ↑ activation energy c. ↓ pH value d. ↑ the pH value
- 2-An enzyme that joins the ends of two strands of nucleic acid is:
a. Polymerase b. ligase c. synthetase d. Helicase
- 3-Which of the following is produced with the combination of apoenzyme and coenzyme.....
a. Holoenzyme b. Enzyme substrate complex c. Prosthetic group d. Enzyme product complex
- 4-Which one among them is the example of competitive inhibition of an enzyme.....
a. succinic dehydrogenase by malonic acid b. cytochrome oxidase by cyanide
c. hexokinase by glucose-6-phosphate d. carbonic anhydrase by carbon dioxide
- 5-The enzyme minus its coenzyme known as.....
a. apoenzyme b. metalloenzyme c. isoenzyme d. All of these
- 6-Which among them is not attribute of enzymes:
a. specific in nature b. protein in chemistry c. consumed in reaction d. increased rate of reaction
- 7-Iodoacetate- glyceraldehyde 3- phosphate dehydrogenase is inhibitor of enzymes.
a. Reversible b. Irreversible. c. Allosteric d. All of above
- 8-Feed back inhibition means.....
a. initial product inhibition b. end product inhibition c. enzymatic induction d. none of the above
- 9-The enzyme which break up nucleic acid into nucleotides are called.....
a. Nucleases b. Amylases c. Proteases d. Hydrolases
- 10-Enzymes are sensitive to change
a. pH b. Temperature c. Substrate concentration d. All of them

4- Elevation of non- plasma enzymes due to.....

a. tissue injury & necrosis b. obstructive processes c. abnormal rate of synthesis d. All are true

25- Enzymes assay usually carried out for the diagnosis of myocardial infarction are.....

a. CPK b. AST c. LDH d. All are true

II- Indicate whether the sentence is true (T) or false (F) (12.5 Marks)

- 1- Inhibition of HMG-CoA reductase by cholesterol is example for feedback inhibition. ()
- 2- Anti cancer drugs as competitive inhibitors are useful chemotherapeutic agents. ()
- 3- Enzyme assays measure either the consumption of substrate or production of product over time. ()
- 4- Blank solution contains everything except the compound to be measured. ()
- 5- In discontinuous assay of ALT, addition of 2,4-dinitrophenylhydrazine (DNPH) stops the reaction and forms the 2,4-dinitrophenylhydrazone measured at 360nm. ()
- 6- Glucose oxidase enzyme (EC number 1.1.3.4) is an oxidoreductase that catalyses the oxidation of glucose to hydrogen peroxide and D-glucono- δ -lactone. ()
- 7- Thyroid peroxidase oxidizes iodide ions to form iodine atoms for addition onto tyrosine residues on thyroglobulin for the production of T₄ and T₃. ()
- 8- Cytochromes P450 (CYPs) are a superfamily of enzymes containing heme as a cofactor that function as monooxygenases in mitochondria. ()
- 9- Protein kinase C is activated by signals such as increases in the level of DAG or Ca²⁺. ()
- 10- Carbonic anhydrase plays an important role in respiration and maintained blood pH 7.4 by influencing CO₂ transport in the blood. ()
- 11- Enzyme inhibitors are substances which alter the catalytic action of the enzyme and consequently slow down, or in some cases, stop catalysis. ()
- 12- Non-plasma specific enzymes are either absent or present in low concentrations in plasma. ()
- 13- In the liver ALP is attached to biliary canicular and sinusoid membranes of the hepatocytes, decreased ALP level is usually associated with blockage of the bile ducts. ()
- 14- Amylase is used clinically in the diagnosis of pancreatic disorders. ()
- 15- Serum lipase and amylase level in peritoneal fluid were used to differentiate between acute pancreatitis and other abdominal disorders. ()

Course title: Enzymology (Z502)
Second Semester 2022-2023
Time: 2 hours
Total degree: 50



المقرر: علم الانزيمات (Z502)
الفصل الدراسي الثاني 2023-2022
الزمن: ساعتان
الدرجة الكلية: 50

Question 1: Fill in the following sentences

(25 marks)

1. Digestion of ingested microbes by enzymes occurs within
2. TB bacilli is a type of bacteria causing
3. is an inherited deficiency in the production of one of several subunits of NADPH oxidase.
4. is an enzyme in saliva and tears and acts as a natural substance that hydrolyzes bacterial cell wall.
5. Arginine depletion was ascribed as in cancer treatment for arginine auxotrophic tumors, hence the enzyme is used as such treatment.
6. is seen in the inner membrane of mitochondria and is the predominant glutamine-using enzyme in the brain.
7. enzyme is used for the treatment of acute lymphoblastic leukemia.
8. Skin Ulcer is an open wound that develops on the skin as a result of injury, poor circulation, or pressure. Hence, enzyme can be used as a treatment for the hydrolysis of
9. enzyme is employed in medicine to increase drug diffusion and reverse the effects of HA filler injections and is also used to inhibit viral replication.
10. is an enzyme that converts plasminogen to plasmin and is used for medical treatment of myocardial infarction.
11. Once CTLs recognize the target cells they produce toxic proteins such as and which penetrate the target cell through the holes and activates
12. is congenital perforin deficiency and is considered a rare cause of human immunopathology and immune dysregulation.
13. is characterized by cellular swelling caused by a failure in ion transporter function.
14. Lack of apoptosis in humans can lead to webbed fingers phenomenon called
15. Most of the functional plasma enzymes are synthesized in the
16. and are examples of non-functional plasma enzymes, and their substrates are in the plasma.
17. Lipase enzyme is used for the diagnosis of
18. is used for the diagnosis of metastatic carcinoma of the prostate, while phosphatase (alkaline) is used for the diagnosis of

انتهت الأسئلة مع تمنياتنا بالنجاح

أ.د/ جمال جمال بدر

أستاذ المناعة - كلية العلوم - جامعة أسيوط



Question 1: Fill in the following sentences

(25 marks)

11-Digestive enzymes breakdown ingested food molecules by.....

- a. Oxidation b. Hydrolysis c. Reduction d. Conjugation

12-Pepsin is example for which class of enzymes?

- a. Hydrolases b. Ligases c. Oxidoreductases d. Lyases

13-Name the enzyme which catalyzes the oxidation-reduction reaction?

- a. Transaminase b. Glutamine synthetase c. Phosphofructokinase d. Oxidoreductase

14-In continuous assay of ALT the absorbance at 340nm is measured each minute without stopping the reaction, resulting in decreased readings due to.....

- a- oxidation of NADH b. oxidation of NADPH c. reduction of NADH d. reduction of NADPH

15- Classification of enzymes has been recognized by.....

- a- International Union of Physiology b- International Union of Biochemistry
c- International Union of Biotechnology d-International Union of Genetic Engineering

16-19-.....is used as a marker to detect acute pancreatitis.

- a) amylase b) acid phosphatase c) γ glutamyltransferase d) Creatine kinase

17-.....is used as a marker to detect myocardial infarction

- a) LDH b) Creatine kinase c) AST d) All of these

18- Which of the following can be used to determine the rate of enzyme-catalyzed reactions?

- a. rate of disappearance of the enzyme b. rate of disappearance of the substrate
c. rate of disappearance of the product d. change in volume of the solution

19- What is the process called by which proteins lose their shape and function?

- a. Denaturation b. Hydrolysis c. Deamination d. Transamination

20- Pepsin is examples for which class of enzymes.

- a.hydrolases b. ligases c. oxidoreductases d. lyases

21- The coenzyme is basically a

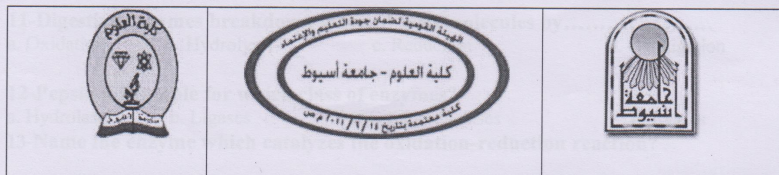
- a. protein b. carbohydrate c. vitamin d. none of these

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Biochemistry Diploma

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a. Nucleases b. Amylases c. Proteases d. Hydrolases
- 10-Enzymes are sensitive to change
a. pH b. Temperature c. Substrate concentration d. All of them

- 3- Pheochromocytoma is a type of neuroendocrine tumor in adrenal medulla results in excess production of adrenaline or noradrenaline ()
- 4- TSH level test used to predict the start of menopause in addition to check infants with genitals that are not clearly identified as male or female ()
- 5- Heart secretes atrial natriuretic peptide hormone (ANP) which regulates sodium and water reabsorption by the kidneys ()
- 6- Androgens usually produced by genitals and small amount produced by pancreas ()
- 7- Insulin in humans is similar to insulin in animals ()
- 8- The best time for taking the blood sample to measure testosterone level is between 7 p.m. and 10 p.m. because during these hours, testosterone levels are typically the highest ()
- 9- Low concentration of potassium in blood stimulates aldosterone secretion ()
- 10- Testosterone increases the Basal Metabolic Rate (BMR) ()

With our best wishes
 Prof. Dr/ Marwa Abdel-Azez
 Dr/ Hanan Waly
 2023

Part (2): (25 marks)

I- Put a circle around the correct answer of the following: (10 marks)

- 1- One of the following hormones responsible for enhancing gastric motility and secretion HCl into the stomach.
(Cortisol – Glucagon – Somatostatin – Gastrin)
- 2- Osteoporosis is may be resulted from (Chronic low – Too much) testosterone secretion in men.
- 3- Testosterone, cortisol and aldosterone are (Peptide – Steroid) hormones.
- 4- (Estrogen – Progesterone – FSH) hormone causes the development of female secondary sex characteristics at puberty.
- 5- Kidneys release (Atrial natriuretic peptide (ANP) – Renin - K^+) which is converted into angiotensin II that in turn stimulates aldosterone release.
- 6- During the menstrual cycle, the (menstruation – proliferative – secretory) phase extends from end of menstruation till mid-cycle in which the endometrium is regenerated under the influence of estrogen from the developing follicles.
- 7- (Aldosterone – Cortisol – Adrenaline – Glucagon) has immunosuppressive function which can be used to prevent rejection in organ transplantation.
- 8- (E2 - Progesterone – AMH – TSH) test is often used to check the woman's ovarian reserve.
- 9- Diabetes mellitus (Type 1 – Type 2) is characterized by insulin resistance and usually develops after age of 40.
- 10- All of the following are from functions of insulin except.....
 - a) Stimulates glucose uptake by muscle and adipose tissue.
 - b) Increase formation of fatty acids and lipid synthesis.
 - c) Conversion of stored glycogen in the liver to glucose.
 - d) Stimulate protein synthesis.

II- Complete the following sentences: (5 marks)

- 1- cells are stimulated by hormone to secrete testosterone that is essential for the development and maintenance of spermatogenesis.
- 2- There are reversible diabetes conditions include and
- 3- From the functions of adrenal gland medulla hormones and in response to stress.
- 4- Polypeptide and protein hormones are soluble, allowing them to enter the circulatory system easily. They are stored in of different endocrine cells until needed.
- 5- results from excessive production of cortisol from the adrenal glands causing buffalo hump and purple stretch marks on the abdomen. Whereas, known as primary adrenal insufficiency characterized by low levels of adrenal hormones and patients may have bronze skin pigmentation.

III- Put (True) or (False) and CORRECT the false statements: (10 marks)

- 1- Diabetes can be diagnosed if random glucose levels are higher than 200 mg/dL ()
- 2- Progesterone increases uterine contraction during pregnancy ()

Part (2): (25 marks)

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III- Put (True) or (False) and CORRECT the false statements: (10 marks)

- 1- Diabetes can be diagnosed if random glucose levels are higher than 200 mg/dL ()
- 2- Progesterone increases uterine contraction during pregnancy ()

- 20- A 45-year-old woman is noted to have fatigue and cold intolerance and is diagnosed with hypothyroidism. Her physician suspects a primary cause (in thyroid gland). Which of the following laboratory findings is most consistent with this condition?
- Low thyroxine and low TSH.
 - Low thyroxine and high TSH.
 - High thyroxine and high TSH.
 - High GH and Low GHRH.
- 21- The hormone acts on the intestine and causes increased calcium absorption:
- Corticotropin releasing hormone (CRH).
 - Vitamin D3 (1, 25-dihydroxycholecalciferol).
 - Aldosterone hormone.
 - Pancreatic polypeptide.
- 22- One of the following is a symptom of manifest tetany:
- Carpal spasm.
 - Renal stones.
 - Bone fracture.
 - Hypercalciuria.
- 23- Thyroid hormone secretion is stimulated by hot weather.
- True
 - False
- 24- In physiological amounts, parathyroid hormone has protein anabolic effect.
- True
 - False
- 25- Normal level of thyroid hormones stimulates protein synthesis.
- True
 - False
- 26- Growth hormone causes protein catabolism.
- True
 - False
- 27- Cretinism is a disease caused by extreme thyroid hormone deficiency after puberty.
- True
 - False
- 28- There is increase in both thyroid gland size and thyroid hormones secretion in myxedema.
- True
 - False
- 29- Which of the following increase the thyroid hormone levels in the blood?
- Increase iodine levels in the circulation.
 - Elevated thyroid stimulating immunoglobulin levels in the blood.
 - Exposure to hot environment.
 - Increase uptake of thiocyanate in diet.
- 30- Which of the following hormones are transported bound with plasma protein?
- Insulin.
 - Growth hormone (GH).
 - Thyroxine.
 - Glucagon.
- 31- Thyroid hormone increases all of the following EXCEPT:
- Heart rate.
 - Venous return.
 - Cardiac output.
 - Blood pressure and mean arterial pressure.
- 32- The iodine uptake by the thyroid gland is blocked by:
- Thyroid inhibitory hormone
 - Thyroid stimulating immunoglobulin (TSI)
 - Thiocyanates
 - Iodine
- 33- Iodides are stored in the thyroid follicles mainly in the form of:
- Thyroxine.
 - Thyroglobulin.
 - Triiodotyrosine.
 - Diiodotyrosine.

9- Which of the following is NOT a function of thyroid hormone?

- a. Increase the basal metabolic rate.
- b. Increases heart rate and stroke volume.
- c. Stimulate physical, mental and sexual growth.
- d. Decrease the synthesis of vitamin A from carotenes.

10- Hyperparathyroidism causes:

- a. Manifest tetany.
- b. Increased neuromuscular excitability.
- c. Decrease the serum levels of calcium below the normal.
- d. Hypercalciuria and formation of stones in the kidney.

11- Antidiuretic hormone (ADH) is synthesized mainly in:

- a. Supra optic nuclei
- b. Para optic nuclei
- c. Para ventricular nuclei
- d. Anterior pituitary

12- Decrease in growth hormone secretion before puberty produces:

- a. Acromegaly.
- b. Pituitary dwarfism.
- c. Gigantism.
- d. Infantilism.

13- Nephrogenic diabetes insipidus is endocrine abnormality due to:

- a. Decrease ADH release from the posterior pituitary.
- b. Renal insensitivity in response to the effect of ADH.
- c. Decrease of insulin secretion from B cells of pancreas.
- d. Increase ADH release from the posterior pituitary gland.

14- The purpose of the hypothalamic- hypophyseal portal circulation is enabled the hypothalamic hormones to be delivered to the systemic circulation.

- a. True
- b. False

15- All of the following are hormones of the anterior pituitary EXCEPT:

- a. Antidiuretic hormone (ADH).
- b. Follicle- stimulating hormone (FSH).
- c. Growth hormone (GH).
- d. Thyroid-stimulating hormone (TSH).

16- Which of the following is not secreted by the thyroid gland?

- a. Thyroxin (T4)
- b. Calcitonin
- c. Parathormone hormone
- d. Triiodothyronine (T3)

17- Which of the following is the principal thermogenic hormone (increase heat production)?

- a. Parathyroid hormone
- b. ADH
- c. Thyroxine
- d. Aldosterone

18- The yellowish color of the skin in myxedema is due to:

- a. Carotenemia
- b. Increased bilirubin
- c. Anemia
- d. Decrease cholesterol

19- Which of the following would you suspect if there is a pituitary tumor secreting thyroid stimulating hormone (TSH)?

- a. Decreased TSH secretion and increased thyroxin.
- b. Increased both TSH and thyroxin secretion.
- c. Increased TSH secretion and decreased thyroxin.
- d. Decrease both TSH and thyroxin secretion.



Assiut University



Faculty of Science

**Final exam of Endocrinology C503
(Biochemistry Diploma)
Two hours**

Part (1): (25 marks)

Choose the correct answer of the following:

- 1- Which one of the following factors inhibits thyroxine release:
 - a. Thyrotropin releasing hormone (TRH).
 - b. Cold climate.
 - c. Hot weather.
 - d. Thyroid stimulating immunoglobulins (TSI)
- 2- Which of the following is a function of thyroid hormone?
 - a. Essential for the normal development of the nervous system.
 - b. Decreases the strength of myocardial contraction.
 - c. Decreases the appetite and food intake.
 - d. Has anti allergic effect.
- 3- Which of the following statements regarding the thyroid gland are correct?
 - a. A person with hyperthyroidism has a cold intolerance.
 - b. Calcitonin is secreted by the parafollicular cells of the thyroid gland.
 - c. The maximum amount of thyroid hormones binds with plasma protein albumin.
 - d. T4 is more biologically potent than T3.
- 4- Which of the following is NOT a function of thyroid hormone?
 - a. Increase the basal metabolic rate.
 - b. Increases heart rate and stroke volume.
 - c. Stimulate physical, mental and sexual growth.
 - d. Decrease the synthesis of vitamin A from carotenes.
- 5- Which one of the following hormones has the greatest effect on basal metabolic rate:
 - a. Growth hormone
 - b. Cortisol
 - c. Somatostatin
 - d. Thyroxine
- 6- A 33-year-old woman is noted by her physician to have some fatigue and some coarse skin. She has weight gain and low heart rate. The following laboratories has been reported:
TSH 0.1 mU/L (0.35-6.0 mU/L) Free thyroxine 0.3 ng/dL (0.8-2.7 ng/dL), total thyroxine 2µg/dL (4.5-12.0 µg/dL) and Thyroid-binding globulin (TBG) 10 ng/mL (15-34 mg/L).
Which of the following is the most likely diagnosis?
 - a. Hyperthyroidism
 - b. Primary hypothyroidism
 - c. Normal thyroid status
 - d. Secondary hypothyroidism
- 7- Thyroid hormone decreases:
 - a. Rate of absorption of carbohydrates.
 - b. Circulating cholesterol levels.
 - c. O₂ consumption in almost all metabolically active tissue.
 - d. Nitrogen excretion.
- 8- Which of the following is NOT TRUE parathyroid hormone?
 - a. PTH increases renal tubular reabsorption of Ca.
 - b. PTH acts directly on bone to increase calcium absorption.
 - c. Hypoparathyroidism causes decreased neuromuscular excitability.
 - d. PTH secretion is increased when plasma calcium levels decreased.

Q4- Describe: (9 marks)

- A- Functions of Growth hormone on growth and metabolism of the body.
B- Four Laboratory finding in patients with diabetes insipidus.

(5 marks)

(4 marks)

Part (2): (25 marks)

I- Choose the correct answer of the following sentences: (10 marks)

- 1- Estrogen is a steroid hormone which synthesized and immediately released (True - False).
- 2- Kidney is the main target organ of (insulin - glucagon - aldosterone) hormone.
- 3- (Adrenaline - Cortisol - Aldosterone) has anti-inflammatory, anti-stress and metabolic actions.
- 4- Progesterone is a hormone produced (before - after) ovulation that is critical to successful implantation.
- 5- (E2 - Progesterone - AMH - TSH) is often used to check a woman's ability to produce eggs that can be fertilized for pregnancy.
- 6- (Fasting blood glucose - Random blood glucose - Haemoglobin A1C) test reflects the person's long-term trends in blood glucose levels rather than rapid changes.
- 7- It is (True - False) that insulin and glucagon are steroid hormones.
- 8- FSH play an important role in (control menstrual cycle - ovulation) in females.
- 9- Insulin secreted from (Alpha - Beta) cells of islets of Langerhans.
- 10- (Menstruation - Proliferative - Secretory) phase extends from day 15 until beginning of the next menstrual flow during the ovarian cycle.

II- Answer only Four from the following questions: (10 marks)

- 1- Mention the female hormonal tests which recommended in the case of infertility or menstrual cycle irregularities.
- 2- Give a short note about cushing syndrome (cause and symptoms).
- 3- Enumerate three functions of progesterone?
- 4- Compare between type-1 and type-2 diabetes mellitus.
- 5- Illustrate the site of secretion of the following hormones:
a) cortisol b) Estrogen c) Glucagon d) Adrenaline E) Testosterone

III- Explain with only a labeled diagram Two of the following: (5 marks)

- 1- Homeostasis of blood glucose level.
- 2- Synthesis and secretion of peptide hormones.
- 3- Structure of adrenal gland and hormones secreted by its parts.
- 4- Influence of testosterone on the body.

With our best wishes
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Dr/ Hanan Waly
2024



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Faculty of Science

**Final exam of Endocrinology C503
(Biochemistry Diploma)
Two hours**

Part (1): (25 marks)

Q1: Choose the best single answer of the following: (7 marks)

1- Which of the following is **FALSE** about parathyroid hormone (PTH) ?

- a) PTH increases renal tubular reabsorption of Ca .
- b) PTH acts directly on bone to increase calcium resorption.
- c) Hypoparathyroidism causes decreased neuromuscular excitability.
- d) PTH secretion is increased when plasma calcium levels decreased.

2- Which of the following about the growth hormone is **FALSE**?

- a) Is stimulated by somatostatin released from the hypothalamus.
- b) Increases when the blood glucose level falls.
- c) Increases the size of viscera.
- d) Stimulates liver production of somatomedins.

3- Blood calcium level is regulated by the hormones of:

- a) Parathyroid gland.
- b) Both parathyroid and thyroid glands.
- c) Anterior Pituitary gland.
- d) Posterior pituitary gland.

4. Which of the following is inconsistent with the diagnosis of Graves' disease?

- a) Increased heart rate
- b) Increased plasma levels of thyroxine (T4)
- c) Exophthalmos
- d) Increased plasma levels of thyroid-stimulating hormone

5- Parathyroid hormone:

- a) Controls directly the rate of formation of 1, 25-dihydroxycholecalciferol.
- b) Stimulates renal tubular phosphate reabsorption.
- c) Stimulates directly the intestinal calcium reabsorption.
- d) Stimulate sodium reabsorption from intestine.

6- Which of the following anterior pituitary hormones plays a major role in the regulation of a nonendocrine gland?

- a) Adrenocorticotrophic hormone.
- b) Thyroid-stimulating hormone.
- c) Prolactin.
- d) Follicle-stimulating hormone.

7- Thyroid hormone normally:

- a) Inhibits glycolysis.
- b) Enhances protein catabolism.
- c) Inhibits the serum free fatty.
- d) Stimulate utilization of glucose by the cells.

Q2- Case Study: (5 marks)

A female patient 45 years old, complained that, despite eating less, she had gained 10 kg in the past 6 months. She also complained that she has very little energy, always feels cold (when everyone else is hot), and is constipated. Her skin is yellowish. In addition, the physician noticed that her neck was very full.

- 1- Based on her symptoms, what is the most likely diagnosis of this condition?
- 2- How were her symptoms of weight gain and cold intolerance consistent with the diagnosis?
- 3- Write the hormonal profile which must be estimated.
- 4- How to differentiate between primary and secondary type of this case?
- 5- Explain yellowish discoloration of the skin.

Q 3- Enumerate Four manifestations of hyperparathyroidism. (4 marks)

Q4- Describe: (9 marks)

- A- Functions of Growth hormone on growth and metabolism of the body.
B- Four Laboratory finding in patients with diabetes insipidus.

(5 marks)
(4 marks)

Part (2): (25 marks)

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Two hours**

Part (1): (25 marks)

Q1: Choose the best single answer of the following: (7 marks)

1- Which of the following is **FALSE** about parathyroid hormone (PTH) ?

- a) PTH increases renal tubular reabsorption of Ca .
- b) PTH acts directly on bone to increase calcium resorption.
- c) Hypoparathyroidism causes decreased neuromuscular excitability.
- d) PTH secretion is increased when plasma calcium levels decreased.

2- Which of the following about the growth hormone is **FALSE**?

- a) Is stimulated by somatostatin released from the hypothalamus.
- b) Increases when the blood glucose level falls.
- c) Increases the size of viscera.
- d) Stimulates liver production of somatomedins.

3- Blood calcium level is regulated by the hormones of:

- a) Parathyroid gland.
- b) Both parathyroid and thyroid glands.
- c) Anterior Pituitary gland.
- d) Posterior pituitary gland.

4. Which of the following is inconsistent with the diagnosis of Graves' disease?

- a) Increased heart rate
- b) Increased plasma levels of thyroxine (T4)
- c) Exophthalmos
- d) Increased plasma levels of thyroid-stimulating hormone

5- Parathyroid hormone:

- a) Controls directly the rate of formation of 1, 25-dihydroxycholecalciferol.
- b) Stimulates renal tubular phosphate reabsorption.
- c) Stimulates directly the intestinal calcium reabsorption.
- d) Stimulate sodium reabsorption from intestine.

6- Which of the following anterior pituitary hormones plays a major role in the regulation of a nonendocrine gland?

- a) Adrenocorticotrophic hormone.
- b) Thyroid-stimulating hormone.
- c) Prolactin.
- d) Follicle-stimulating hormone.

7- Thyroid hormone normally:

- a) Inhibits glycolysis.
- b) Enhances protein catabolism.
- c) Inhibits the serum free fatty.
- d) Stimulate utilization of glucose by the cells.

Q2- Case Study: (5 marks)

A female patient 45 years old, complained that, despite eating less, she had gained 10 kg in the past 6 months. She also complained that she has very little energy, always feels cold (when everyone else is hot), and is constipated. Her skin is yellowish. In addition, the physician noticed that her neck was very full.

- 1- Based on her symptoms, what is the most likely diagnosis of this condition?
- 2- How were her symptoms of weight gain and cold intolerance consistent with the diagnosis?
- 3- Write the hormonal profile which must be estimated.
- 4- How to differentiate between primary and secondary type of this case?
- 5- Explain yellowish discoloration of the skin.

Q 3- Enumerate Four manifestations of hyperparathyroidism. (4 marks)



Assiut University
Faculty of Computer &
Information
Computer Science Department

Course Name: Selected Topics in CS
Course ID: Master (Faculty of Science)
Duration: 3 Hours
Date: 4/7/2024
Academic Year: 2023-2024
Semester: ☐ 1st ☒ 2nd ☐ Summer



Final Exam

Answer the following question sets.

Q1

- A. Discuss two main *applications* of GRASP. (5 Grades)
B. Explain the *basic components* of GRASP. (5 Grades)

Q2

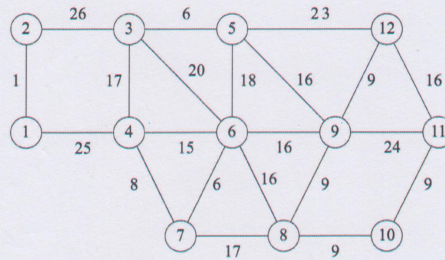
- A. Describe, in brief, the *path-relinking algorithm*. (5 Grades)
B. How can we achieve the *automatic tuning* of GRASP. (5 Grades)

Q3

- A. Explain using *one example the hybridizations* of GRASP with other metaheuristics. (5 Grades)
B. Discuss two applicable *enhancements* to GRASP. (5 Grades)

Q4

- A. State with your explanation the main steps of the *basic VNS*. (5 Grades)
B. Apply the basic VNS to find a *minimum k-cardinality tree* for the graph instance shown below. (5 Grades)



Q5.

- A. Discuss how the VNS can be implemented to solve the *Mixed-Integer Linear Programming*. (5 Grades)
B. Explain the main idea and steps for *Variable Neighborhood Programming*. (5 Grades)

End of Exam



V- Choose the correct answer: (1 mark each)

1- Sections to be viewed under the electron microscope are usually cut at what thickness:

- a- 10 μm .
- b- 5 μm .
- c- 10 nm.
- d- 50 nm.

2- Which of the following is used as a secondary fixative?

- a- Osmium tetroxide.
- b- 70% ethanol.
- c- Glacial acetic acid.
- d- Picric acid.

3- Millon's reaction is specific for:

- a- Sulphydryl.
- b- Tyrosine.
- c- Disulphide.
- d- Arginine.

4- Pseudo choline esterase is mainly present in:

- a- CNS.
- b- Muscles.
- c- RBCs.
- d- Glands.

5- Which of the following is Not used as a light source in fluorescence microscope?

- a- A halogen lamp.
- b- The daylight.
- c- Tungsten lamp.
- d- A high pressure mercury lamp.

6- Which of the following is a physical method for detection of lipids?

- a- Copper- rubianic acid.
- b- Acid hematin method.
- c- Sudan black.
- d- Plasmal technique.

7- Which of the following is Not a histochemical method for carbohydrates?

- a- Acridine red.
- b- PAS method.
- c- Metachromasia.
- d- Best's carmine.

8- Amylases are used to digest:

- a- Glycogen.
- b- Hyaluronic acid.
- c- Proteins.
- d- DNA.

9- Which of the following has strain birefringence?

- a- Nucleoprotein.
- b- Lipids.
- c- Muscle.
- d- Proteins.

10- Which of the following is Not a metachromatic stain?

- a- Toluidine blue.
- b- Crystal violet.
- c- Basic Fuchsin.
- d- Trichrome stains.

VI- Put true (T) or false (F): (1 mark each)

- 1- The limit of resolution reverses the resolving power. ()
- 2- The phase microscope facilitates the study of stained material. ()
- 3- Acid phosphatase acts in an alkaline medium (pH 9.0). ()
- 4- The effect of radioactivity increases with the decrease of distance between the section and photographic emulsion. ()
- 5- Oxidases can act in the absence of O₂ (anaerobic). ()
- 6- Endogenous peroxidase activity must be blocked before treating the sections with peroxidase labelled antibody. ()
- 7- Tritiated uracil allows demonstration of RNA. ()
- 8- α -metachromasia gives blue color. ()
- 9- Ribonuclease is used to remove DNA. ()
- 10- In scanning electron microscope; the beam of electron is transmitted through the object. ()

-----انتهت الأسئلة مع تمنياتنا لكم بالتوفيق-----



Assiut University
Faculty of Medicine

Department of: Histology

دبلومة الدراسات العليا المهنية في كيمياء الطب الشرعي المتقدمة

Histochemistry (MD504)

امتحان مقرر الكيمياء النسيجية 2024م

Date: 4-7-2024

Time: 2 hours

Total marks: 50 marks

Number of pages: 2

I. Enumerate: (2 marks each)

- 1- Types of histochemical methods.
- 2- Methods for demonstration of RNA.
- 3- Types of techniques used in enzyme histochemistry.
- 4- Types of electron microscopy.

II. Define the following: (2 marks each)

- 1- Histochemistry and cytochemistry.
- 2- Autoradiography.
- 3- Empty magnification.
- 4- Metachromasia.

III. Complete: (1/2 mark for each space)

- 1- Using enzyme histochemistry; certain cellular structures can be illustrated: ATPase for....., esterase for..... and acid phosphatase for.....
- 2- Fluorescent products can be seen with.....microscope, while crystalline products can be seen with..... microscope.
- 3- Strong acidophila suggests the presence of..... in a tissue.
- 4- Some components of cells and tissues can modify polarized light and are known to be
- 5- Interference microscopy is used to determine the and.....content of the cell.
- 6- The requirements of chemical nature for histochemical methods are:, and

IV. Define immunocytochemistry and describe with diagram the direct fluorescent antibody method. (4 marks)

V- Describe with diagram the wire loop coating method of the photographic emulsion of autoradiography and List the other methods of application of the photographic emulsion. (4 marks)

.....بأقي الأسئلة في الصفحة التالية.....



Faculty of
Science
Academically accredited in 2011
Accreditation renewal 2017

Chemistry Department



C 516-Professional Diploma in Quality Control Final Exam
June 2024

Time allowed: 2 hr

Answer the following questions.

(50 Marks)

- 1) Define the following:
Internal Audit - External Audit- Audit checklist- Quality Policy . *(8 Marks)*
- 2) To auditing a laboratory process, there are certain requirements which an auditor should consider while preparing the audit checklist. What are they? *(8 Marks)*
- 3) What is the purpose of the QMS? *(8 Marks)*
- 4) What are the documents and records that are mandatory for ISO 9001? *(8 Marks)*
- 5) What is the procedure for control of documents and records? *(8 Marks)*
- 6) **Tick (✓) for the true sentence and (x) to the false one:** *(10 Marks)*
 1. Validation is the step where you build a version of the product and would be done against the requirements as modified after verification.
 2. A good product validation can help decide which requirements need to be checked on every product, and which do not.
 3. Verification is a theoretical exercise designed to make sure that no requirements are missed in the design, whereas validation is a practical exercise that ensures that the product, as built, will function to meet the requirements.
 4. Verification and validation ensure that the product designed will satisfy the customer needs, and the needs of the customer are one of the keys focuses for ISO 9001 and improving Customer Satisfaction.
 5. If a laboratory has not maintained process documentation, an auditor will use general ISO 9001 standard requirements to review the process.

Good luck

Prof. Nagwa Abo El-Maali

III. Complete the following statements:

(10 Marks)

1. In Widal test, titer level greater than is considered as significant infection.
2. The antibodies level of streptolysin O starts to rise in after streptococcal infection, peaks in, and then goes back to insignificant level over, so a positive test can indicate
3. An antistreptolysin titer, greater than is considered a positive test in adults, while the normal value for adults is less than 200 IU/ml, which indicates a negative test.
4. Measurement of ASO antibody titer is important in the investigation of and
5. High levels of rheumatoid factor in the blood are most often associated with such as
6. The high levels of CRP are observed in,, and
7. The physiological role of CRP is
8. Laboratory diagnosis of enteric fever includes and

IV. Define lab acquired infections (LAI) and what are the main routes of possible biological exposure which may lead to a LAI? (4 Marks)

V. List the diseases which can raise rheumatoid factor levels in the blood? (4 Marks)

VI. Compare between the four risk groups classification for biohazardous agents. (6 Marks)

VII. Explain the detection method and clinical significance of uric acid in blood. (5 Marks)

VIII. Differentiate between type I and II diabetes. (4 Marks)

IX. Explain the detection method and clinical significance of calcium in blood. (5 Marks)

Good Luck

Prof. Dr. Nagwa Abo El-Maali Dr. Tharwat Mansoure

Test	Plasma (adults)	Urine	Absorbance wavelength
Urea			
Uric acid (Men)			
Total protein			
Calcium			
Fasting glucose			



Faculty of Science
Chemistry Department

C-505 Practical Biochemistry I Final Exam for the Professional Diploma in
Biochemistry

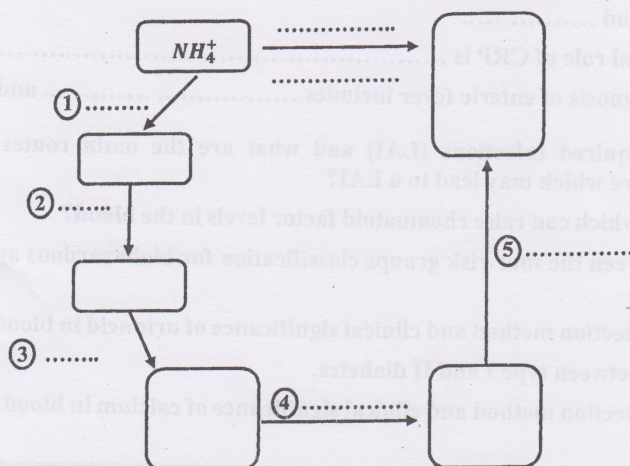


Feb. 27, 2024
Time: 2 hours

Answer the following questions:

(50 Marks)

I. Berthelot reaction used for urea determination in blood, complete the following scheme in your answer sheet: (6 Marks)



II. Complete the following table in your answer sheet:

(6 marks)

Test	Reference value		Absorbance wavelength
	Plasma (adults)	Urine	
Urea			
Uric acid (Men)			
Total protein			
Calcium			
Fasting glucose			

21-- The sum of squares between treatments (SSB) is equal:

- a) 104.80 b) 264.93 c) 181.3

22-- The mean square between treatments (MSB) is equal:

- a) 60.4 b) 8.73 c) 88.80

23-- The sum of squares within treatments (SSW) is equal:

- a) 552.4 b) 264.93 c) 160.13

24-- The mean square within treatments (MSW) is equal:

- a) 80.07 b) 34.5 c) 88.8

25-- At $\alpha=0.05$, test the hypothesis H_0 that there is no differences among the three treatments, will concluded to:

- a) Reject H_0 b) cannot reject H_0

You may use the tabulated values

$$\chi^2_{0.05,14} = 6.571, \chi^2_{0.95,14} = 23.685, t_{0.95,12} = 1.78$$

$$\Phi(0.5) = P(-\infty < Z < 0.5) = 0.6915, \Phi(1.5) = P(-\infty < Z < 1.5) = 0.9332,$$

$$Z_{0.99} = 2.33, Z_{0.975} = 1.96, Z_{0.995} = 2.58, Z_{0.95} = 1.65$$

$$F(0.95,3,16) = 3.2$$

=====

Answer Table

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25					

Best Wishes

Professor Mohamad Adel & Professor Zeinhum Jaheen

12-- At $\alpha=0.05$, the conclusion and your decision is:

- a) Reject H_0 b) cannot reject H_0

13-- The 90% confidence interval for p is:

- a) (0.721, 0.638) b) (0.638, 0.721) c) (-0.97, 2.33)

A sample of 15 items provides a sample standard deviation of 11.2,

[answer ques. (14-16)]:

14-- The 90% confidence interval for the population standard deviation σ is:

- a) (8.611, 16.348) b) (79.44, 286.349) c) (74.146, 267.259)

Considering the following hypothesis:

$$H_0: \sigma^2 = 126 \quad VS \quad H_1: \sigma^2 \neq 126$$

15-- The value of the test statistic is equal:

- a) 14.933 b) 14.062 c) 13.938

16-- At $\alpha=0.1$, the conclusion and your decision is:

- a) Reject H_0 b) Cannot reject H_0

The pulse rates for 13 adult women were as follows:

83 58 70 56 76 64 80 76 70 97 68 78 108

[answer ques. (17-20)]:

17-- The point estimate of the population mean is equal:

- a) 78.45 b) 76.5 c) 75.69

18-- The point estimate of the population standard deviation is equal:

- a) 75.69 b) 14.54 c) 211.41

Considering the following hypothesis:

$$H_0: \mu = 75 \quad VS \quad H_1: \mu \neq 75$$

19-- The value of the test statistic is equal:

- a) 17.01 b) 0.17 c) 1.70

20-- At $\alpha=0.1$, the conclusion and your decision is:

- a) Reject H_0 b) Cannot reject H_0

Four laboratories are being used to perform chemical analysis. Samples of the same material are sent to the laboratories for analysis as part of a study to determine whether or not they give, on the average, the same results. The analytical results for the four laboratories are as follows:

A	58	61	60	59	58
B	62	64	63	59	60
C	55	56	57	55	53
D	60	60	60	61	62

Applying the ANOVA method: [answer questions (21-25)]

Faculty of Science		Final Exam 2023-2024
Mathematics Department	Biostatistics(MS504)	Time: Two Hours

Choose the correct Answer: (2 marks per each)

Remark: Please approximate your answer to the given degree

If the mean height of students of some college is 150 cm, and the standard deviation is 10 cm. Assuming a Normal population; [answer questions (1-4)]

- 1- The probability of students who heights are less than 145 cm=...
a) 0.3085 b) 0.6915 c) 1.0
- 2- The probability of students who heights are between 145 and 155 cm =...
a) 0.6170 b) 0.3830 c) 0.6915
- 3- The probability of students who heights are greater than 165 cm=...
a) 0.9332 b) 0.0344 c) 0.0668
- 4- For a random sample of size 25 students, the probability that its sample mean is greater than 165 cm equals
a) 0.0 b) 1.0 c) 0.5

A doctor knows from experience that 10% of the patients to whom he gives a certain drug will have undesirable side effects. For the 10 patients to whom he gives the drug. Find the probabilities that: (Answer questions (5-7))

- 5- At most two patients will have undesirable side effects.
a) 0.9300 b) 0.0700 c) 1.0
- 6- Four patients will have undesirable side effects
a) 0.0014 b) 0.0112 c) 0.9889
- 7- At least two patients will have undesirable side effects
a) 0.7360 b) 0.6045 c) 0.2640

A sample of size 40 provides a sample mean of 26.4. If we know that the population standard deviation is $\sigma = 6$. For testing the following hypothesis:

$$H_0: \mu = 25 \quad VS \quad H_1: \mu > 25 ; \quad [\text{answer questions (8-10)}]$$

- 8--The value of the test statistic is equal:
a) -1.476 b) 0.233 c) 1.476
- 9-- At $\alpha=0.01$, the conclusion and your decision is:
a) Reject H_0 b) cannot reject H_0
- 10-- The 95% confidence interval for μ is equal:
a) (24.54, 28.26) b) (23.95, 28.85) c) (28.26, 24.54)

A sample of size 300 provides a sample proportion $\hat{p} = 0.68$. Consider the following hypothesis test: [answer questions (11-13)]

$$H_0: p = 0.75 \quad VS \quad H_1: p \neq 0.75$$

- 11-- The value of the test statistic is equal:
a) 2.8 b) 0.0 c) -2.8

Course title: Biological Fluids (MD503)
First Semester 2023-2024
Time: 2 hours
Total degree: 50



المقرر: علم السوائل البيولوجية (MD503)
الفصل الدراسي الأول 2023-2024
الزمن: ساعتان
الدرجة الكلية: 50

a brain Her CT revealed cerebral bleeding the lumbar puncture was done for fluid should be taken is:

- a. Synovial Fluid
c. Pleural fluid

- b. Cerebrospinal Fluid
d. Peritoneal Fluid

Question 4: Fill in the following sentences:

(10 marks)

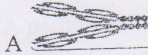
1. has activity against thyroid tissue and penicillin.



2. test will be required for patient suffering from bloating and abdominal pain



3. enzyme ate for breakdown in Immunoglobulin resulting in immunoglobulin fragment



A & B

4. pushed through the capillary due to high pressure within the capillary. is fluid that leaks around the cells of the capillaries caused by inflammation.

5. is formed of β -D-N-acetyl glucosamine linked to β -D
6. The Percentage contribution of each of the secretions in seminal fluid 40-80%

7. The test can used for urine examination.

8. Mention the name of each crystals and cells



9. Synoviocytes production.....&.....
10..... is defined as a milky appearing, triglyceride-rich and is characterized by the accumulation of true from thoracic or intestinal lymph.

انتهت الأسئلة مع تمنياتنا بالنجاح

أ.د/ جمال جمال بدر

أ.د/ نجلاء إدريس

Course title: Biological Fluids (MD503)
First Semester 2023-2024
Time: 2 hours
Total degree: 50



المقرر: علم السوائل البيولوجية (MD503)
الفصل الدراسي الأول 2024-2023
الزمن: ساعتان
الدرجة الكلية : 50

7. Immunologic studies of synovial fluid is
a. Microscopic examination. b. X- Ray.
c. Complement. d. PCR
8. Gastric juice is a mixture of water and
a. Hyaluronic acid, electrolytes and organic substances.
b. Carbohydrates and electrolytes. d. HCL and Organic substances.
c. Glycoprotein and lactose.
9. Effects of anti-sperm antibodies
a. Increased progressive motility. b. Increased ability to penetrate egg.
c. Decreased ability to penetrate cervical mucus.
d. increased ability to penetrate cervical mucus.
10. The hormone somatostatin is secreted by
a. D cells b. Chief cell
c. Goblet cells d. Parietal cells
11. Regulation of gastric secretion three phases
a. The gastric phase, the abdominal phase, the intestinal phase.
b. The gastric phase, the pancreatic phase, the intestinal phase.
c. The intestinal, the cephalic phase, the colic phase.
d. The gastric phase, the cephalic phase, the intestinal phase.
12. Female patients 45 years was suffering from with severe pain and heart burn Too much acid gives a feeling of heart burn. There is back flow of stomach content (acid) upward into esophagus symptoms: pain and inflammation. extreme reflux? The case is:
a. Peptic ulcer and gastric fluid b. Acid gastric reflux.
c. Chronic diseases. d. Ascites and peritoneal fluid
13. Plays a key role in cell-cell recognition.
a. Membrane carbohydrates b. Peripheral protein
c. Cholesterol d. Glycoprotein
- 
14. types of moving large molecules into of cell through vesicles & vacuoles
a. Phagocytosis& pinocytosis b. Exocytosis
c. Exocytosis& pinocytosis
d. Endocytosis, pinocytosis& receptor-mediated endocytosis.
15. A 63-year-old woman was presented in the emergency department with a car accident and head trauma with headache, accompanied by nausea and vomiting. On admission, her vital signs were normal. Due to her worsening headache and nausea, she underwent

Course title: Biological Fluids (MD503)

First Semester 2023-2024

Time: 2 hours

Total degree: 50



المقرر: علم السوائل البيولوجية (MD503)

الفصل الدراسي الأول 2023-2024

الزمن: ساعتان

الدرجة الكلية : 50

3. Rh refers to the presence or absence of the.....on the surface of.....
4. Hematopoiesis occurs before birth inand, but after birth it occurs in.....
5. The granulocyte that plays an important role in allergic reactions is defined as....., while plays important roles in parasitic infections.
6. The dietary factors and are needed for DNA synthesis, while dietary is needed for hemoglobin synthesis.
7. Thrombocytopenia is a decrease in the number of
8. DC are originated from both and

Question3: Choose the Correct answer: (15 questions 1mark each)

1. A peritoneal effusion is the accumulation of peritoneal fluid, in the abdominal cavity.
a. called pericardial effusion
b. called distension
c. called ascites
d. visceral obesity
2. What is a semen analysis?
a. For test the crystals in urine
b. Routine test for fertility
c. Routine test for infertility
d. For morphology of sperm
3. Tissue transglutaminase (tTG) immunoglobulin A (IgA) &(IgG) tests for
a. Myocardial infarction
b. Pleural effusion
c. Celiac diseases
d. Cancer
4. A 62-year-old male, with a past medical history cardiac diseases, who was brought to the emergency department with complaints of chest pain. With no fever on arrival, his heart rate increased. His blood pressure was 150/110 mmHg. Which type of effusion and fluid:
a. Pericardial effusion with transudate fluid
b. Pleural effusion with exudate fluid
c. Pericardial effusion with exudate fluid
d. Pleural effusion with transudate fluid
5. The pleural cavity normally contains less than ----- ml of fluid.
a. 50
b. 30
c. 45
d. 150
6. The pericardium normally contains less than ----- ml of fluid.
a. 50
b. 120
c. 150
d. 30

Total degree: 50



الدرجة الكلية : 50

1. B 12 deficiency leads to:
 - a)- microcytic anemia
 - b)- macrocytic anemia
 - c)- normocytic anemia
 - d)- thalassemia
2. Hereditary spherocytosis and elliptocytosis or RBCs are:
 - a)- membrane defects
 - b)- hemoglobin defects
 - c)- enzyme defects
 - d)- iron deficiency
3. Increase in the total RBC mass and Hct > 65% are indicators for:
 - a)- A plastic anemia
 - b)- jaundice
 - c)- polycythemia
 - d)- Sickle cell anemia
4. The cells that are important for clearing bacterial infections are:
 - a)- eosinophils
 - b)- NK cells
 - c)- basophils
 - d)- neutrophils
5. The cells which produce antibodies are:
 - a)- B cells
 - b)- memory cells
 - c)- monocytes
 - d)- T cells
6. Band cells are:
 - a)- immature neutrophils
 - b)- mature neutrophils
 - c)- immature RBCs
 - d)- immature basophils
7. O blood group person is universal donor because he has:
 - a)- neither A nor B antigens
 - b)- O antigen
 - c)- both anti-A and anti-B Abs
 - d)- both A and B antigens
8. AB blood group person has:
 - a)- both A and B antigens
 - b)- neither A nor B antigens
 - c)- no antibodies in the plasma
 - d)- both a and c
9. The transplantation of organs that require no immunosuppressive agents is:
 - a)- Allotransplants
 - b)- Xenotransplants
 - c)- Autotransplants
 - d)- all the above
10. The cells that complete their maturation in the thymus gland are:
 - a)- DC cells
 - b)- macrophages
 - c)- T cells
 - d)- lymphocytes

1. The immature RBCs are known as
2. Leukemia is characterized by an abnormal increase of

IV- Give short account on: 12 marks (3 mark each)

1. Three differences between suicidal & homicidal cut throat.
2. Definition and medicolegal importance of lucid interval.
3. Medicolegal importance of powder marks.
4. Medicolegal importance of hypostasis.

For Applied Forensic chemistry diploma students

11/11/2019 Date: MDS11 Time: 3 h Marks: 50 marks

Answer all the following questions:

* Multiple choice questions: 20 mark (12 mark each)

1. The medical condition resulting in a body not getting enough oxygen due to mechanical causes is called:
a) Asphyxia
b) Arsenia
c) Coma
d) carbon dioxide poisoning
2. A middle aged person was found dead in an inverted position of house without any sign of violence act, but there was high blood alcohol concentration. The probable cause of death was:
a) Smothering
b) Suffocation
c) Hanging
d) Potomac asphyxia
3. The autopsy report in a forensic report that it is a case of asphyxia with injuries inside the respiratory passages. This case may be due to:
a) Smothering
b) Hanging
c) Choking
d) Potomac asphyxia
4. A dead woman was found with signs of asphyxia and a plastic bag covered her head, death occurs by:
a) Smothering
b) Throttling
c) Choking
d) Ligature strangulation

II- Complete the following: 10 marks (2mark each)

a) Phases of death are:

- 1.....
- 2.....

b) Autopsy should be performed in the following cases:

- 1.....
- 2.....

c) Medicolegal importance of forensic entomology studies:-

- 1.....
- 2.....

d) Blunt instrument wounds are: 1,

- 2....., 3.....

e) Most certain evidence of sex is:

.....
While the highly probable evidence is

III- Sign true or false and correct false statement: 8 marks
(2mark each)

1) Hesitation marks can be seen in homicidal wounds. ()

2) Auricular cardiac wounds are more dangerous than ventricular wounds. ()

3) A distended bladder can rupture in females after a lower abdomen blow. ()

4) Stab wounds are longer than deep in the contrary of the cut wounds. ()

13. A child of 12 years, the expected number of teeth in his mouth is:

- a) 28 teeth
- b) 24 teeth
- c) 32 teeth
- d) 20 teeth

14. Which of the following adult bone is most useful in determining sex?

- a) Humerus
- b) Femur
- c) Clavicle
- d) Pelvis

15. Dangerous wound is a:

- a) Wound which heals in less than 20 days leaving no permanent infirmity
- b) Wound which heals in more than 20 days
- c) Wound which is usually fatal
- d) None of mentioned

16. Tissue bridges are seen in:

- a) Abrasion
- b) Laceration
- c) Bruises
- d) Stab wound

17. In an incised wound, all the following are true except:

- a) It has clean cut margins
- b) Length of injury corresponds with length of weapons
- c) Bleeding is generally less than lacerations
- d) Tailing is often present

18. The following type of hymen is considered to have medicological importance:

- a) Crescentic hymen
- b) Cribriform hymen
- c) Septate hymen
- d) Imperforate hymen

19. Sexual intercourse with a relative with forbidden marriage is called:

- Incest
- b) Bestiality
- c) Necrophilia
- d) Buggery

20. Black eye is not a result to the following causes:

- a) Direct trauma of the eye
- b) Fracture base of the skull
- c) Migration from forehead bruise
- d) Hereditary pigmentation

5. A dead body was discovered in a river, sure signs of drowning are:

- a) Pallor and washerwoman hands
- b) Diatoms and cutis anserina
- c) Hyperinflation and indentation marks in the lung
- d) Froth and cadaveric spasm

6. A case of death due cardiac arrest as a result of vagus stimulation by a piece of food impacted in the pharynx, this case is called:

- a) Respiratory distress syndrome
- b) Café coronary syndrome
- c) Strangulation
- d) Carotid sleeper syndrome

7. The color change in putrefaction is first seen in:-

- a) Left cubital fossa
- b) Right iliac fossa
- c) Left iliac fossa
- d) Right cubital fossa

8. Gunshot residue can be detected on:-

- a) The hands of victim of suicidal death
- b) Clothes of the victim in far distant firing
- c) The hand of the gloves assailant
- d) All of the above

9. Exit wound of gunshot contain:-

- a) Signs of burning
- b) blackening
- c) Tattooing
- d) None of the above

10. The postmortem autopsy of a case of asphyxia revealed the presence of horizontal ligature mark in the neck. This character is seen in:

- a) Hanging
- b) Throttling
- c) Chocking
- d) Strangulation by ligature

11. Diastatic fracture:

- a) Caused by a heavy sharp instrument.
- b) Occurs in old age
- c) It is a type of depressed fracture
- d) It is separation of non-united sutures

12. Fate of brain concussion may be:

- a) Complete recovery
- b) Passing to compression
- c) Death
- d) All of mentioned



Assiut University

كلية العلوم



Faculty of science
Chemistry Department

Final Exam – Forensic Medicine

For Applied Forensic chemistry diploma students

13/2/2024

Code: MD511

Time: 3 h

Marks: 50 marks

Answer all the following questions:

I- : Multiple choice questions: 20 mark (1 mark each)

1. The medical condition resulting in a body not getting enough oxygen due to mechanical causes is called :

- a) Asphyxia
- b) Anemia
- c) Coma
- d) carbon dioxide poisoning

2. A middle aged person was found dead in an inverted position at home without any sign of violence act, but there was high blood alcohol concentration. The probable cause of death was:

- a) Smothering
- b) Choking
- c) Gagging
- d) Positional asphyxia

3. The autopsy report in a neonate reveals that it is a case of asphyxia with injuries inside the respiratory passages. This case may be due to:

- a) Smothering
- b) Hanging
- c) Choking
- d) Positional asphyxia

4. A dead woman was found with signs of asphyxia and a plastic bag covered her head, death occurs by:

- a) Smothering
- b) Throttling
- c) Choking
- d) Ligature strangulation

33. Which of the following leads to negative nitrogen balance?

- a) Trauma
- b) Pregnancy
- c) Childhood
- d) Recovery from an emaciating illness

34. Deficiency of vitamin D causes

- a) Tuberculosis of bone
- b) Rickets and osteomalacia
- c) Hypothyroidism
- d) Bone cancer

35. Which of the following is characteristic of marasmus?

- a) Enlarged fatty liver
- b) Poor appetite
- c) Severe muscle wasting
- d) Edema is present

Part II: True / False (15 Marks, 1 Mark each):

1. Kwashiorkor child is alert and irritable.
2. Several small meals are better than large ones in acute hepatitis.
3. Type I diabetic patients should follow a regular pattern of meals.
4. Negative nitrogen balance occurs when nitrogen intake exceeds nitrogen excretion.
5. Non-essential amino acids can be formed by the body.
6. Sodium is the main intracellular cation.
7. Cushing's syndrome is one of the causes of hyponatremia.
8. Starch is an example of a complex carbohydrate.
9. Monounsaturated fats lower LDL-C but maintain or increase HDL-C.
10. Fibers decrease bowel motility and inhibit normal laxation.
11. Tissue necrosis leads to hyperkalemia.
12. About 80% of total body copper is present in muscle.
13. Coconut and palm oils are the main sources of saturated fat.
14. Vitamin E is the first line of defense against lipid peroxidation.
15. Cholesterol is found in animal and plant products.

End of the exam

Good Luck

يرجى الالتزام بكتابة الإختيار الصحيح (a, b, c or d) في الجدول

Part I: Multiple Choice

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
31.	32.	33.	34.	35.					

يرجى الالتزام بكتابة الإجابة الصحيحة (T or F) في الجدول

Part II: True / False

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
11.	12.	13.	14.	15.					

20. Calcification of soft tissues can occur in:

- a) Osteomalacia
- b) Rickets
- c) Hypervitaminosis D
- d) None of these

21. Anti xerophthalmic vitamin is:

- a) Vitamin B1
- b) Vitamin B2
- c) Vitamin B6
- d) Vitamin A

22. Which one of the following pairs is not correctly matched?

- a) Vitamin C and scurvy
- b) Vitamin A and night blindness
- c) Vitamin B12 and pernicious anemia
- d) Vitamin B2 and pellagra

23. Vitamin K is required for

- a) Change of prothrombin into thrombin
- b) Synthesis of prothrombin
- c) Change of fibrinogen to fibrin
- d) Formation of thromboplastin

24. Vitamin K is found in

- a) Cauliflower and cabbage
- b) Meat
- c) Fish
- d) Milk

25. Transketolase activity is affected in

- a) Biotin deficiency
- b) Pyridoxine deficiency
- c) PABA deficiency
- d) Thiamine deficiency

26. Lack of dietary fibers causes

- a) Kwashiorkor
- b) Rickets
- c) Dysentery
- d) Constipation

27. Lactose can also be called as

- a) Milk sugar
- b) Malt sugar
- c) Cane sugar
- d) Grape sugar

28. In peptic ulcer, patient should avoid:

- a) Highly spiced food
- b) Irritant drugs
- c) Alcohol
- d) All of the above

29. One gram of carbohydrates produces kcal on oxidation in the body

- a) 9
- b) 7
- c) 8
- d) 4

30. Trans fatty acids are major components of:

- a) Sunflower oil
- b) Corn oil
- c) Deep fried foods
- d) Olive oil

31. Biotin is important in

- a) Hydroxylation
- b) Decarboxylation
- c) Carboxylation
- d) Deamination

32. Which of the following is source of saturated fats?

- a) Corn oil
- b) Sunflower oil
- c) Olive oil
- d) Palm oil

8. The pellagra preventive factor is:

- a) Riboflavin
- b) Pantothenic acid
- c) Niacin
- d) Pyridoxine

9. Which of the following is necessary for the clotting of blood and contraction of muscles?

- a) Calcium
- b) Magnesium
- c) Copper
- d) Cobalt

10. A copper containing oxidase is

- a) Cytochrome oxidase
- b) Flavin mononucleotide
- c) Flavin adenine dinucleotide
- d) Xanthine oxidase

11. The following mineral is important for maintenance of the myelin:

- a) Zinc
- b) Iron
- c) Copper
- d) Sulfur

12. Selenium is a constituent of the enzyme:

- a) Glutathione peroxidase
- b) Homogentisate oxidase
- c) Tyrosine hydroxylase
- d) Phenylalanin hydroxylase

13. Iron is transported in blood in the form of:

- a) Ferritin
- b) Haemosiderin
- c) Transferrin
- d) Haemoglobin

14. Which of the following mineral is essential for high energy bond formation?

- a) Iron
- b) Calcium
- c) Phosphorus
- d) Copper

15. Which of the following mineral deficiency may result into impaired growth and delayed puberty?

- a) Zinc
- b) Cobalt
- c) Iron
- d) Calcium

16. Pellagra occurs in population dependent on:

- a) Wheat
- b) Rice
- c) Maize
- d) Milk

17. Cobalt containing vitamin is:

- a) B12
- b) B6
- c) B1
- d) B2

18. A vitamin which can be synthesized by human beings is:

- a) Thiamin
- b) Niacin
- c) Folic acid
- d) Cyanocobalamin

19. Hydroxylation of vitamin D occurs in:

- a) Skin
- b) Liver
- c) Brain
- d) Intestinal mucosa



Assiut University
Faculty of Medicine
Medical Biochemistry Department

10-2-2024
Time: 2 hours

Final Exam of Human Nutrition (MD505)
For Faculty of Science Postgraduate Students

Part I: Multiple Choice (35 Marks, 1 Mark each):

1. An important function of vitamin A is:

- a) To act as coenzyme for a few enzymes
- b) To play an integral role in protein synthesis
- c) To prevent hemorrhage
- d) To maintain the integrity of epithelial tissue

يرجى الالتزام بكتابة الإجابة

الصحيحة في الجدول المخصص

للإجابة في الصفحة الأخيرة

2. Retinal is a component of:

- a) Lecithin
- b) Rhodopsin
- c) Cardiolipin
- d) Glycoproteins

3. All the following conditions produce deficiency of vitamin K except:

- a) Prolonged oral, broad spectrum antibiotic therapy
- b) Total lack of red meat in the diet
- c) The total lack of green leafy vegetables in the diet
- d) Being a new born infant

4. Vitamin synthesized by bacteria in the intestine is:

- a) A
- b) C
- c) D
- d) K

5. Hypovitaminosis K in neonates may cause:

- a) Porphyria
- b) Jaundice
- c) Pellagra
- d) Prolonged bleeding

6. Folic acid deficiency in early pregnancy leads to..... in newborns:

- a) Spina bifida
- b) Cretinism
- c) Rickets
- d) Osteoporosis

7. Niacin is synthesized in the body from:

- a) Tryptophan
- b) Tyrosine
- c) Glutamate
- d) Aspartate

14. The hormone that inhibit gastric secretion and motility is...

- a. Gastrin b. histamine c. secretin d. Pepsin

15. The antigens (agglutinogens) for ABO and Rh blood groups are present on

- a. Plasma b. White blood cells c. Red blood cells d. Platelets

16. If the blood group of an individual is B then, the antibody present is

- a. Anti B antibodies b. Anti A antibodies c. Anti O antibodies d. Anti OA antibodies

17. If the blood group of an individual is AB then the antibody present is

- a. Anti B antibodies b. Anti A antibodies
c. Both anti A and anti B antibodies d. Neither anti A nor anti B antibodies

18. In blood typing, if agglutination occurs with antibodies A and D then, the blood group is

- a. A+ b. B- c. A- d. AB+

19. Leucopenia means

- a. Increase in the number of WBCs b. Decrease in the number of WBCs
c. Increase in the number of platelets d. Decrease in the number of WBCs

20. Basophils release all of the following EXCEPT

- a. Histamine b. Antibodies c. Prostaglandins d. Leukotrienes

Q2: Write true (T) or false (F) about the following sentences. (10 marks)

1. In active transport diffusion occurs against concentration gradient.
2. Parietal cells principally secrete hydrochloric acid (HCl).
3. Rennin changes the casein of milk irreversibly to a paracasein in the presence of calcium.
4. Eosinophils have antiparasitic and antiallergic functions.
5. Formation of antibodies is the function of B-lymphocytes.
6. Average amount of hemoglobin in a single RBC is called MCV.
7. Hemorrhagic anemia is caused by iron deficiency.
8. The antibodies (agglutinins) for ABO and Rh blood groups are present in RBCs.
9. The most active antigen in Rh system is C antigen.
10. Osmosis occurs from low to high concentration

Q3: Write short note on (FIVE) only from the following. (20 marks)

1. Causes of stomach cancer.
2. Factors affecting RBCs production.
3. Aplastic anemia.
4. Differences between innate and acquired immunity.
5. Structure and function of plasma membrane.
6. Blood transfusions, who can receive blood from whom?

Good Luck

Dr. Sohair M.M. Ragab

 Assiut University	Course: Biological fluids Year: 2023 - 2024 Time: Two hours Marks: 50	 Faculty of Science
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Answer the following questions

Q1: Choose the correct answer (20 marks)

1. Mature red blood cells in the circulating blood are filled with

- a. Hemoglobin molecules
- b. Smooth endoplasmic reticulum
- c. Mitochondria
- d. Lysosomes

2. Site of removal of RBCs is

- a. Kidney
- b. Bone marrow
- c. Spleen
- d. Thyroid gland

3. Which of the following statements about erythrocytes is CORRECT?

- a. They fight infection
- b. They clot blood
- c. They lack a nucleus
- d. They are produced in the thyroid

4. Which of the following is a function of RBCs?

- a. Transport oxygen and carbon dioxide.
- b. Blood clotting
- c. Defend against infection
- d. Produce antibodies

5. Polycythemia means

- a. Increase in number of leucocytes
- b. Increase in number of erythrocytes
- c. Increase in number of thrombocytes
- d. Increase in amount of plasma proteins

6. Which of the following decreases hematocrit?

- a. At high altitude
- b. Polycythemia
- c. Anemia
- d. Dehydration

7. Where does erythropoiesis take place in the adults?

- a. Lungs
- b. Pancreas
- c. Liver
- d. Bone marrow

8. Erythropoiesis occurs in fetus in all the following EXCEPT

- a. Yolk sac
- b. Flat bones
- c. Liver
- d. Spleen

9. Which of the following is an example of extracellular fluid?

- a. Cytosol
- b. Plasma
- c. Interstitial Fluid
- d. Both b and c

10. Which of the following correctly describes passive transport?

- a. the cell uses ATP in passive transport
- b. most pumps are examples of passive transport
- c. diffusion is an example of passive transport
- d. exocytosis is an example of passive transport

11. Simple diffusion occurs .

- a. with transporters in the cell membrane
- b. directly across the cell membrane
- c. through exocytosis
- d. through endocytosis

12. Which of the following is an example of active transport?

- a. Filtration
- b. Endocytosis
- c. Exocytosis
- d. Both b and c

13. Chief cells of gastric mucosa secrete...

- a. Trypsin
- b. bicarbonate ions
- c. pepsinogen
- d. HCl

8- is specialized cells present in Islets of Langerhans and responsible of secreting insulin.

- a) Alpha cells b) Beta cells c) Delta cells d) F cells

9- Only one of the following is a main symptom of congenital adrenal hyperplasia.

- a) Hypokalemia
b) Purple stretch marks on the abdomen.
c) Appearing of male characteristics in girls.
d) Irregular high blood pressure.

10-perhaps is the best-known endocrine disorder.

- a) Diabetes mellitus b) Cushing syndrome c) Conn syndrome d) Addison's disease

II- Answer only Four from the following questions: (10 marks)

- 1- Mention the functions of testosterone.
- 2- Give a short note about conn syndrome.
- 3- What are the sites of secretion and functions of estrogen?
- 4- Mention the major symptoms of diabetes mellitus.
- 5- Discuss the anti-inflammatory action of cortisol.

III- Explain with only a labeled diagram the following: (5 marks)

- 1- Homeostasis of blood calcium level.
- 2- Structure of adrenal gland and hormones secreted by its parts.

*With our best wishes
Prof. Dr/ Marwa Abdel-Azez
Dr/ Hanan Waly
2024*

1- Based on her symptoms, what is the most likely diagnosis of this condition?

2-How were her symptoms match with the diagnosis?

3- Comment on the levels of the following hormones by (increased- decreased - normal)
Thyroxine- TSH- Growth hormone

Q 3- Enumerate Four manifestations of Acromegaly: (4 marks)

1- ----- 2- -----
3- ----- 4- -----

Q4- Describe: (9 marks)

A- Functions of parathyroid hormone on bone (5 marks)

B- Four Laboratory finding in patients with Hyperparathyroidism (4 marks)

1- ----- 2- -----
3- ----- 4- -----

Part (2): (25 marks)

I- Choose the correct answer of the following sentences: (10 marks)

1- Homeostasis is controlled by

- a) Hormones b) Nervous system c) (a & b) d) None of them

2- is one of secondary endocrine organs.

- a) Pituitary gland b) Testes c) Pancreas d) Heart

3- One of adrenal gland disorders leading to fatty deposits in certain areas of the body, such as the face (moon face) and below the back of the neck called a buffalo hump is called

- a) Cushing syndrome b) Conn syndrome
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4- Hormones of pancreas belong tohormones.

- a) Polypeptide b) Steroid c) Derivatives of the amino acid tyrosine d) None of them

5- Glucocorticoids such as cortisol secreted from.....

- a) Zona glomerulosa b) Zona fasciculata c) Zona reticularis d) Adrenal medulla

6- increases renal tubular reabsorption of sodium and increases potassium and hydrogen secretion by the renal tubules.

- a) Cortisol b) Glucagon c) Aldosterone d) Epinephrine

7- Endocrine disorders may be caused by.....

- a) Excess production of hormones.
b) Insufficient production of hormones.
c) Nonfunctional receptors on target cells.
d) All of them.



Assiut University



Faculty of Science

Final exam of Endocrinology C503
(Biochemistry Diploma)
Two hours

Part (1): (25 marks)

Q1: Choose the best single answer of the following: (7 marks)

1-Which of the following is **TRUE** about parathyroid hormone (PTH)?

- a. PTH decreases the renal tubular reabsorption of Ca.
- b. PTH levels are increased when calcium levels increased.
- c. Hypoparathyroidism causes decreased neuromuscular excitability.
- d. PTH increases both Ca^{++} and phosphate reabsorption from the intestine indirectly.

2- Which of the following about the growth hormone is **FALSE**?

- a. Is stimulated by somatostatin released from the hypothalamus.
- b. Increases when the blood glucose level falls.
- c. Increases the size of viscera.
- d. Stimulates liver production of somatomedins.

3- Growth of the body may be affected by hormones of:

- a. Mammary gland.
- b. Thyroid glands.
- c. Anterior Pituitary and thyroid gland.
- d. Posterior pituitary gland.

4. Which of the following is matching with the diagnosis of Graves' disease?

- a. Decreased heart rate
- c. Decreased plasma levels of thyroxine (T_4)
- b. Dry skin with brittle hair
- d. Increased plasma levels of thyroid-stimulating hormone

5- Which of the following **INCREASES** secretion of anti diuretic hormone?

- a. Increase in blood volume.
- b. Decrease of the plasma osmotic pressure.
- c. A moderate decrease in ECF volumes.
- d. Excessive hydration.

6- Which of the following pituitary hormones plays a major role in milk ejection?

- a. Oxytocin hormone.
- b. Thyroid-stimulating hormone (TSH)
- c. Prolactin hormone.
- d. Follicle-stimulating hormone.

7- Thyroid hormone normally:

- a. Inhibits glucose absorption from the intestine
- b. Enhances protein catabolism.
- c. Inhibits the serum free fatty.
- d. Stimulate utilization of glucose by the cells.

Q2: Case Study:

(5 marks)

A female patient has 30 years old. She is a doctor, married and has two children. She is complaining of troubles regarding her growth. The female was short stature compared with her friends in the same age. She is about 120 cm .

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Assiut University



Faculty of Science

Final exam of Endocrinology C503
(Biochemistry Diploma)
Two hours

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8. Sodium intake should be increased in patients with hypertension.
9. Kwashiorkor occurs due to deficiency of proteins and calories.
10. Non-essential amino acids can be formed by the body.
11. Cholesterol is found only in plant products.
12. Starch is an example of a complex carbohydrate.
13. Coconut and palm oils are the main sources of polyunsaturated fat.
14. Spinach is a poor source of iron.
15. Several small meals are better than large ones in acute hepatitis.

End of the exam

Good Luck

يرجى الالتزام بكتابة الإختيار الصحيح (a, b, c or d) في الجدول

Part I: Multiple Choice

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
31.	32.	33.	34.	35.					

يرجى الالتزام بكتابة الإجابة الصحيحة (T or F) في الجدول

Part II: True / False

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
11.	12.	13.	14.	15.					

30. Lactose is

- a) Galactose + fructose
- b) Glucose + galactose
- c) Glucose + fructose
- d) Glucose + glucose

31. Which of the following is source of saturated fats

- a) Palm oil
- b) Olive oil
- c) Corn oil
- d) Sunflower oil

32. Which of the following lead to positive nitrogen balance

- a) Trauma
- b) Pregnancy
- c) Burns
- d) Surgery

33. Which of the following is characteristic of marasmus

- a) Enlarged fatty liver
- b) Poor appetite
- c) Severe muscle wasting
- d) Edema is present

34. Which of the following minerals is used to store and release insulin in the β cells of the pancreas?

- a) Iron
- b) Zinc
- c) Copper
- d) Sodium

35. Fats produce kcal per gram on oxidation

- a) 6
- b) 7
- c) 8
- d) 9

Part II: True / False (15 Marks, 1 Mark each):

1. Negative nitrogen balance occurs when nitrogen intake exceeds nitrogen excretion.
2. Potassium is the main intracellular cation.
3. Cushing's syndrome is one of the causes of hyponatremia.
4. About 20% of total body zinc is present in the skin.
5. High LDL-C level is associated with a decreased risk for heart disease.
6. Polysaccharides are favored over monosaccharides.
7. Fibers reduce peaks of blood glucose following a meal.

22. Which of the following is function of zinc

- a) It enters in the formation of bone.
- b) Maintains the myelin within the nervous system
- c) Component of hemoglobin and myoglobin
- d) Anti-inflammatory and hypocholesterolemic

23. Selenium is a constituent of the enzyme:

- a) Glutathione peroxidase
- b) Homogentisate oxidase
- c) Tyrosine hydroxylase
- d) Phenylalanine hydroxylase

24. Which of the following is micromineral

- a) Sodium
- b) Phosphorus
- c) Potassium
- d) Iron

25. Which of the following factors promote calcium absorption?

- a) High dietary phosphate
- b) High protein diet
- c) Excessive alkali intake
- d) Presence of free fatty acid in intestine

26. The most abundant mineral in the body is

- a) Iron
- b) Copper
- c) Calcium
- d) Selenium

27. Which of the following factors does not affect blood calcium level?

- a) Calcitriol
- b) Parathyroid hormone
- c) Calcitonin
- d) Insulin

28. In peptic ulcer, patient should avoid:

- a) Highly spiced food
- b) Irritant drugs
- c) Alcohol
- d) All of the above

29. The best source of iron is

- a) Milk
- b) Organ meats
- c) Potato
- d) Tomato

14. Vitamin -----is essential for synthesis and activation of blood clotting factors

- a) Vitamin C
- b) Vitamin B 12
- c) Vitamin E
- d) Vitamin K

15. Deficiency of vitamin C causes

- a) Scurvy
- b) Pellagra
- c) Pernicious anemia
- d) Beriberi

16. Deficiency of Vitamin A causes

- a) Xerophthalmia
- b) Hypoprothrombinemia
- c) Megaloblastic anemia
- d) Pernicious anemia

17. Deficiency of vitamin D causes

- a) Rickets and osteomalacia
- b) Tuberculosis of bone
- c) Hypothyroidism
- d) Skin cancer

18. Vitamin B1 coenzyme (TPP) is involved in:

- a) Oxidative decarboxylation
- b) Hydroxylation
- c) Transamination
- d) Carboxylation

19. Which of the following is a fat-soluble vitamin?

- a) Vitamin B1
- b) Vitamin C
- c) Vitamin B2
- d) Vitamin E

20. Folic acid is important carrier of:

- a) Amino group
- b) Benzene group
- c) One carbon group
- d) Hydroxy group

21. Deficiency of selenium and its dependent enzymes lead to

- a) Hemolytic anemia.
- b) Liver cirrhosis.
- c) Cataract.
- d) All of the above

6. A deficiency of vitamin B 12 causes **depression and activation of blood clotting factors**
- a) Beriberi
 - b) Scurvy
 - c) Megaloblastic anemia
 - d) Rickets
7. Consumption of raw eggs can cause deficiency of
- a) Biotin
 - b) Pantothenic acid
 - c) Riboflavin
 - d) Thiamin
8. Retinoic acid is important for
- a) Mucin synthesis
 - b) Transferrin
 - c) Reproduction
 - d) All of the above
9. Anti-sterility Vitamin is
- a) Vitamin B1
 - b) Vitamin B2
 - c) Vitamin E
 - d) Vitamin K
10. Niacin is synthesized in the body from
- a) Tryptophan
 - b) Tyrosine
 - c) Glutamate
 - d) Aspartate
11. Carotene is the precursor of
- a) Vitamin A
 - b) Vitamin B2
 - c) Vitamin E
 - d) Vitamin K
12. The active form of vitamin D
- a) 25 hydroxycholecalciferol
 - b) 1, 25 dihydroxycholecalciferol
 - c) 24, 25 dihydroxycholecalciferol
 - d) 1, 24 dihydroxycholecalciferol
13. Vitamin C enhances absorption of
- a) Calcium
 - b) Phosphorus
 - c) Iron
 - d) Zinc



Assiut University

Faculty of Medicine

Medical Biochemistry Department

21-7-2024

Time: 2 hours

Final Exam of Human Nutrition (MD505)

For Faculty of Science Postgraduate Students

Part I: Multiple Choice (35 Marks, 1 Mark each):

1. Pantothenic acid is a component of-----

- a) Coenzyme A
- b) Vitamin B1
- c) Vitamin B6
- d) Vitamin B12

2. Biotin is important in

- a) Hydroxylation
- b) Decarboxylation
- c) Carboxylation
- d) Deamination

3. An important function of rhodopsin is

- a) Night vision
- b) Colored vision
- c) Bright vision
- d) Day vision

4. Folic acid deficiency leads to

- a) Night blindness
- b) Scurvy
- c) Beriberi
- d) Spina bifida

5. Riboflavin deficiency causes

- a) Angular stomatitis
- b) Beriberi
- c) Scurvy
- d) Rickets

يرجى الالتزام بكتابة الإجابة
الصحيحة في الجدول المخصص
للإجابة في الصفحة الأخيرة

4) The following data represent the length of time, in days, to recovery for patients randomly treated with one of two medications to clear up severe bladder infections and assuming normal populations with equal variances:

Medication 1	$n_1 = 14, \bar{X}_1 = 17, S_1^2 = 1.5$
Medication 2	$n_2 = 16, \bar{X}_2 = 19, S_2^2 = 1.8$

i) Find a 99% confidence interval for the difference $\mu_2 - \mu_1$ in the mean recovery times for the two medications

ii) Test the hypothesis that: $H_0: \mu_1 = \mu_2$ VS $H_1: \mu_1 \neq \mu_2$ at $\alpha = 0.01$

5) A researcher wishes to try three different techniques to lower the blood pressure of individuals diagnosed with high blood pressure. The subjects are randomly assigned to three groups; the first group takes medication, the second group exercises, and the third group follows a special diet. After four weeks, the reduction in each person's blood pressure is recorded. Perform the analysis of variance (ANOVA) table and test the claim that there is no difference among the means at $\alpha = 0.05$.

Medication	10	12	9	15	13
Exercise	6	8	3	0	2
Diet	5	9	12	8	4

Tabulated values:

$$\Phi(1) = 0.8413, \Phi(2.74) = 0.9969, \Phi(a) = P(-\infty < Z \leq a), Z \sim N(0,1)$$

$$t(0.975, 14) = 2.1448, t(0.99, 14) = 2.624, t(0.995, 28) = 2.763, F(0.95, 2, 12) = 3.88$$

$$\chi(0.05, 17) = 8.67, \chi(0.95, 17) = 27.59, Z_{0.995} = 2.58$$

Best wishes

Professor Mohamad Adel and Professor Zeinhum Jaheen



Answer the following questions:

1-a) If the mean weight of students of some college is 60 kg with standard deviation 5 kg. Assuming a normal population, compute the following:

- a) The probability of students who weights are less than 55 kg
- b) The probability of students who weights are between 55 kg and 65 kg
- c) The probability of students who weights are greater than 55 kg

b) The probability that a patient recovers from a rare blood disease is 0.4. If 10 people are chosen randomly, compute the probability that:

- a- at least 7 contracted this disease b- exactly 5 contracted this disease

2-a) A study of blood flow velocity has led to the following results in 18 people:

75, 77, 78, 77, 77, 72, 72, 72, 70, 71, 69, 69, 68, 66, 64, 66, 62, 61.

Assuming the population is normally distributed; compute 90% confidence interval for the population variance σ^2 .

b) A sample of 500 nursing applications included 60 from men. Find 99% confidence interval of the true proportion of men who applied the nursing program.

3) The following are the head circumferences (centimeters) at birth of 15 infants:

33.38 32.15 33.99 34.10 33.97
34.34 33.95 33.85 34.23 32.73
33.46 34.13 34.45 34.19 34.05

- a- Compute the point estimate of the head circumferences of the infants.
- b- Compute the 95% confidence interval for the head circumferences of the infants.
- c- Test the hypothesis that: $H_0: \mu = 34$ VS $H_0: \mu < 34$ at $\alpha = 0.01$

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- c- Test the hypothesis that: $H_0: \mu = 34$ VS $H_0: \mu < 34$ at $\alpha = 0.01$

Q2: Complete the following statements:

(15 Marks)

- 1- The enzyme acts as to oxidize in the presence of hydrogen peroxide to produce a blue color.
- 2- The ELISA involves attachment of a capture antibody to a solid phase support.
- 3- For competitive ELISA, the the original antigen concentration, the the eventual signal.
- 4- The sample volume can be to improve the test sensitivity in clinical (saliva, urine), and environmental (water) samples.
- 5- The ELISA utilizes an unlabeled antibody in conjunction with a labeled antibody, since the labeled secondary antibody is directed against all antibodies of a given species.
- 6- ELISA has been used as a diagnostic tool in, and in the food industry as a quality control check.
- 7- Antigens are usually However, they can also be, and nucleic acids.

Q3: Write short notes on the following

(10 Marks)

- 1- Complete blood count analysis.
- 2- SDS PAGE.
- 3- Competitive ELISA.
- 4- RT PCR.
- 5- Advantages of Sandwich ELISA.

Examiners:

Prof. Dr. Nagwa Thabet Abo-Maali

Dr. Amany Abdel-rahman Osman

< Good Luck >

13. The polymerase chain reaction is carried out in a reaction mixture which comprises the DNA extract (template DNA), Taq polymerase, the primers, and the four deoxyribonucleoside triphosphates (dNTPs) in excess in a buffer solution. ()
14. PCR technique is now essential in cellular and molecular biology. ()
15. Polyacrylamide electrophoresis separates macromolecular ions based on a combination of charge, size and shape. ()
16. ELISA tests are broken into several types of tests based on how the analytes and antibodies are bonded and used. ()
17. In direct ELISA involve attachment of the antigen to the solid phase, followed by an enzyme-labeled antibody. ()
18. ELISA is a chemical technique used to detect the presence of an antibody or antigen in a sample. ()
19. In the simplest form of an ELISA, antigens from the sample to be tested are attached to a surface. ()
20. All antibodies are proteins. ()
21. Some competitive ELISA kits include enzyme-linked antibody rather than enzyme-linked antigen. ()
22. A specific antibody is applied over the surface so that it can bind to the antigen. ()
23. ELISpot could be applied in Transplantation, Cancer, Infectious disease and Autoimmunity. ()
24. In competitive ELISA, the higher the concentration of the primary antibody present in the serum, the stronger the color change. ()
25. When the presence of an antigen is analyzed, the name "direct ELISA" refers to an ELISA in which only a labeled primary antibody is used, and the term "indirect ELISA" refers to an ELISA in which the antigen is bound by the primary antibody which then is detected by a labeled secondary antibody.

1		2		3		4		5	
6		7		8		9		10	
11		12		13		14		15	
16		17		18		19		20	
2		22		23		24		25	



**Final Exam of Practical Biochemistry (II)
For Diploma' Students of Biochemistry**

Answer the following questions:

(50 Marks)

Q1: Write True (T) or False (F) in front of the following statements in Table.

(25 Marks)

1. The ELISA is an analytical biochemistry technique that uses antibodies to detect the presence of organic compounds. ()
2. Electrophoresis is a method used to separate charged particles from one another based on differences in their migration speed. ()
3. In sandwich ELISA leaves the antigens suspended in the test fluid. ()
4. As charged particles can migrate between the two separate buffer chambers due to the electric potential difference, positive ions move towards the negatively charged cathode while negatively charged ions move towards the positively charged anode. ()
5. Two compounds are dominantly used for gel electrophoresis: polyacrylamide and agarose. ()
6. PCR is widely used for diagnostic purposes to detect the presence of a specific DNA sequence of this or that organism in a biological fluid and used to make genetic fingerprints. ()
7. The pore size of polyacrylamide gels can be adjusted via the concentration of the acrylamide monomer and the ratio of the crosslinking agent, N,N'-methylenebisacrylamide. ()
8. SDS-PAGE separates proteins based primarily on molecular weight, while isoelectric focusing separates proteins exclusively based on isoelectric point. ()
9. RT PCR is a technique for obtaining small amounts of a specific DNA sequence from a DNA sample. ()
10. Polyacrylamide gels can be used for the separation and analysis of proteins and relatively small nucleic acid molecules. ()
11. PCR is broken down into three phases, a denaturation phase, a hybridization phase with primers, and an elongation phase. ()
12. There are several PAGE methods (SDS-PAGE, isoelectric focusing, 2D PAGE) that can be applied mostly for the separation of proteins based on distinct molecular properties. ()



Biochemistry diploma
Advanced Molecular Biology (B520)

2nd semester, 2024
Time allowed: 2hrs

[illegible]

- 6- Polymerization of dNTP by DNA polymerase is in $3' \rightarrow 5'$ direction.
- 7- Telomerase represents a type of reverse transcriptase.
- 8- In eukaryotes, pol α has both RNA and DNA polymerases.
- 9- Telomerase activity is low in germ line cells.
- 10- RNA splicing takes place in ribosome.
- 11- Transcription factors are proteins that bind to DNA near the start of transcription.
- 12- Transcription factors either inhibit or assist RNA polymerase in transcription.
- 13- During the start of transcription, class II promoters are recognized by RNA polymerase I
- 14- Activation of amino acids for protein synthesis requires energy.
- 15- Just as one amino acid may be specified by more than one codon, one codon may specify more than one amino acid.
- 16- RNA has the exact structure and composition of DNA.
- 17- Translation occurs inside of the nucleus.
- 18- Introns are coding sections of an RNA transcript.
- 19- During translation, the order of the codons in mRNA determines the order of the amino acids in a polypeptide.
- 20- In eukaryotes, there are 61 codons that specify amino acids.

End of questions-Good luck

26- RNA polymerase II is responsible for the transcription of

- (a) tRNA (b) r RNA (c) mRNA (d) snRNA

27- Transcription in eukaryotes requires which of the following in addition to RNA polymerase?

- (a) the protein product of the promoter (b) start and stop codons
(b) ribosomes and tRNA (d) several transcription factors (TFs)

28- Alternative RNA splicing

- (a) is a mechanism for increasing the rate of transcription
(b) can allow the production of proteins of different sizes from a single mRNA
(c) can allow the production of similar proteins from different RNAs
(d) increases the rate of transcription

29- UGA, UAG and UAA are called termination codons because they-

- (a) Terminate anticodon (b) Do not specify any amino acid
(c) Present at the beginning of m-RNA (d) Indicate initiation of polypeptide chain

30- What will be the correct gene expression pathway?

- (a) Gene – mRNA – transcription - translation - protein
(b) Transcription – gene – translation – mRNA - protein
(c) Gene – transcription – mRNA – translation - protein
(d) Gene – translation – mRNA – transcription – protein

II- Mark the true sentences with (T) and false sentences with (F). (20 marks, 1 mark for each) *

- 1- In prokaryotes, during replication, the RNA primer is removed by DNA polymerase I.
- 2- It is easier to break the bond between A and T than in between G and C.
- 3- DNA always carries the genetic information for all organisms.
- 4- DNA separation is promoted by Polymerase.
- 5- Purines and pyrimidines form glycosidic linkage with the pentose sugar at the N1 position.

17- In eukaryotes, the mitochondrial DNA replication is performed by

- a- Pol ϵ b- Pol α c- Pol γ d- Pol δ

18- Telomerase is a complex enzyme, where..... Bind(s) to the TTAGGG sequences in the double strand telomeric DNA

- a- TRF1 and TRF2 b- TN2 c- TN2 and TPP1 d- a and c

19- The hnRNAs contain sequences

- a- Exons only b- introns only c- promoter d- exons and introns

20- During RNA maturing, the cap structure is added to the 5' of the pre- mRNA in

- a- cytoplasm b- nucleus c- nucleolus d- all answers are incorrect

21- In eukaryotes, the mRNA is modified in the nucleus by:

- (a) capping at the 5'-end (b) the addition of a poly(A) tail at the 3'-end
(c) the addition of cap structure at the 3'-end (d) a and b are correct

22- The introns in the pre-mRNA must be removed to produce continuous protein coding sequence in a process known as:

- (a) methylation (b) splicing (c) capping (d) post translation events

23- In the nucleolus of eukaryotes, -----enzyme transcribes the rRNA genes

- (a) RNA polymerase I (b) RNA polymerase II
(c) RNA polymerase III (d) All of the above are correct

24- Regarding mature mRNA in eukaryotes, which of the following is true?

- (a) Exons and introns do not appear in the mature RNA
(b) Exons appear but introns do not appear in the mature mRNA
(c) Introns appear but exons do not appear in the mature mRNA
(d) Both exons and introns appear in the mature mRNA

25- Which of the following plays a role in protein synthesis?

- (a) Introns (b) Exons (c) Both (a) and (b) (d) None of the above

8. In which carbon do the deoxyribonucleotides lack an -OH molecule?
- a. C1 b. C2 c. C3 d. C4
9. Which of the following is known to relax supercoiled DNA?
- a. Endonuclease b. Helicase c. Ligase d. Topoisomerase
10. Which of the following statements is false about DNA?
- a. Abundantly found in cytoplasm b. Formed from polynucleotide chain
- c. Located in chromosomes d. Carries genetic information from parent to offspring
- 11- Which of the following releasing the torsional pressure of DNA supercoiling.
- a- negative supercoil b- writhing c- positive supercoil d- twisting
- 12- what is the writhing number of a relaxed plasmid with linking number = 26.
- a- 26 b- 25 c- 0 d- (-1)
- 13- Which of the following topoisomerases its action is characterized by cleave and rotate
- a- type IA b- type IB c- Type IC d- type II
- 14- which of the following is correct for poly A polymerase enzyme.
- a- It uses DNA template b- it uses NTPs c- it uses no template d- it uses RNA template
- 15- -RNA polymerase III makes..... in eukaryotes.
- a- 18 S rRNA b- 5.8 S rRNA c- tRNA d- hnRNA
- 16-In prokaryotes, the enzyme Primase ispolymerase
- a-DNA-dependent DNA b- RNA-dependent RNA c- DNA-dependent RNA
- d- RNA-dependent DNA



50 marks

I- Choose the correct answer (30 marks, 1 mark for each)

1- Which of the following statements about DNA replication is TRUE?

- a. the leading strand is replicated continuously, while the lagging strand is replicated discontinuously
- b. the leading strand is replicated discontinuously, while the lagging strand is replicated continuously
- c. both the leading and lagging strands are replicated continuously
- d. both the leading and lagging strands are replicated discontinuously

2. How many origin of replication are present in the E. coli genome

- a. 1
- b. 100
- c. 1000
- d. Uncountable

3. Which of the following is a component of the nucleic acid backbone?

- a. Nitrogenous base
- b. Pentose sugar
- c. Amino acid
- d. Hydrogen base

4. Nucleosomes are packing together to form

- a. Chromatid
- b. Chromosome
- c. Solenoid
- d. DNA

5. Place the following in the order that they occur during replication initiation: 1.

Recognition of origin, 2. Unwinding of dsDNA, 3. Primer synthesis, 4. Linking of DNA polymerase.

- a. 2,3,4,1
- b. 2,4,1,3
- c. 2,1,4,3
- d. 1,2,3,4

6. Which of the following is not a character of A DNA?

- a. Short and wide
- b. Left-handed helix
- c. Wide major groove
- d. Narrow minor groove

7. In the case of a circular DNA synthesis how many replication forks are observed?

- a. 1
- b. 2
- c. 3
- d. 4

III. Complete the following statements:

(10 Marks)

1. Urea levels are affected by several factors including and
2. An antistreptolysin titer of or in the serum gives a visible agglutination of the latex particles.
3. Laboratory diagnosis of enteric fever includes, and
4. High levels of rheumatoid factor in the blood are most often associated with such as
5. The physiological role of CRP is
6. An agglutination of rheumatoid factor (RF) latex reagent suspension will occur within two minutes, indicating RF level of
7. The high levels of CRP are observed in,,, and
8. Some disorders may cause a slight increase in urea such as, and

IV. Compare between the four risk groups classification for biohazardous agents.

(6 Marks)

- V. Define lab acquired infections (LAI) and what are the main routes of possible biological exposure which may lead to a LAI? **(4 Marks)**
- VI. Explain the detection method and clinical significance of calcium in blood. **(5 Marks)**
- VII. Differentiate between type I and II diabetes. **(4 Marks)**
- VIII. Explain the detection method and clinical significance of uric acid in blood. **(5 Marks)**
- IX. List the diseases which can raise rheumatoid factor levels in the blood? **(4 Marks)**

Good Luck

Prof. Dr. Nagwa Abo El-Maali

Dr. Tharwat Mansoure

Test	Plasma (adults)	Urine	Reference value
Calcium			
Uric acid (Men)			
Fasting glucose			
Total protein			
Urea			



Faculty of Science
Chemistry Department

C-505 Practical Biochemistry I Final Exam for the Professional Diploma in
Biochemistry

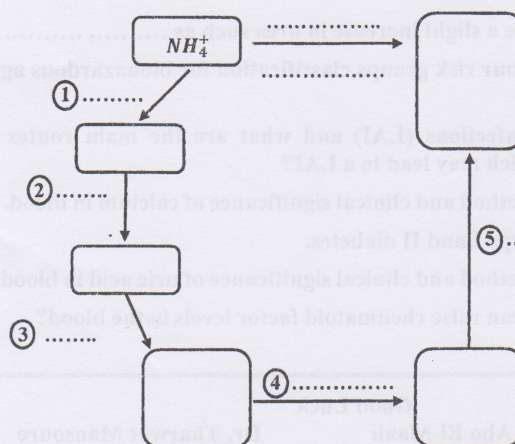


July 18, 2024
Time: 2 hours

Answer the following questions:

(50 Marks)

I. Berthelot reaction used for urea determination in blood, complete the following scheme:
(6 Marks)



II. Complete the following table:

(6 marks)

Test	Reference value		Absorbance wavelength
	Plasma (adults)	Urine	
Calcium			
Uric acid (Men)			
Fasting glucose			
Total protein			
Urea			

Part 2 (30 marks)

(15 marks)

Answer the following questions:

(5 marks for each question)

1. Discuss the key differences between primary and secondary biological databases. Provide examples of each type?
2. What are the five types of BLAST programs and their primary uses?
3. Outline the key steps involved in database searching for biological sequences. For each step, provide a brief description of the tasks performed?

GOOD LUCK

Prof. Dr. Ahmed Maher &&& Dr. Fatma Hussein

Part 2 (30 degrees)

Question No. 3:

(15 marks)

Put T for true and F for false:

(1 mark for each question)

1.	Affinity chromatography is an in silico method used to predict protein-protein interactions.
2.	A higher E-value in a BLAST result indicates a stronger similarity between the query sequence and the database sequence.
3.	UniProt is a comprehensive resource for protein sequence and functional information.
4.	The FASTA format can be used to store both DNA and protein sequences.
5.	PAM and BLOSUM matrices are types of substitution matrices used in sequence alignment
6.	Sequence alignment is the process of arranging two or more sequences of DNA, RNA, or proteins
7.	In vitro technique is a given procedure is performed on the whole living organism itself.
8.	STRING is a database and tool used for analyzing metabolic pathways.
9.	Local alignment is used to align sequences along their entire length.
10.	The EMBL database is used for storing protein structure information

Choose the correct answer A, B, C, or D.

(1 mark for each question)

11. BLAST is an algorithm and program for protein sequences.
 (A) comparing (B) downloading (C) creating (D) eliminating
12. Each database entry described by accession number
 (A) One (B) Double (C) Non (D) Multiple
13. What type of protein-protein interaction involves identical protein chains?
 (A) Hetero-oligomeric (B) Homo-oligomeric (C) Transient (D) Non-obligate
14. Which database is an example of a secondary database?
 (A) EMBL (B) Swiss-Prot (C) PDB (D) TrEMBL
15. Why are gap penalties used in alignment?
 (A) Measure distance (B) Penalize gaps (C) Reward gaps (D) Store data

Question No. 3 answers

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer															

(10 درجات)

السؤال الثاني:

(درجتان لكل سؤال)

اجب على الأسئلة الآتية:

1- ما هو الهدف الرئيسي من قاعدة بيانات HINARI التي تديرها WHO ؟

2- اذكر اثنين من قواعد البيانات الخاصة بتصنيف البروتينات؟

3- ما هي أهمية قاعدة بيانات كيو تو (KEGG) ؟

4- اذكر أحد المواقع المهمة التي يوفرها نظام الاسترداد Entrez والأهمية الرئيسية لهذا الموقع ؟

5- ما هو الهدف الرئيسي لقاعدة بيانات UM-BBD التابعة لجامعة Minnesota الأمريكية؟



كلية العلوم جامعة أسيوط	امتحان نهائي الفصل الدراسي الثاني ٢٠٢٣ - ٢٠٢٤ م	دبلوم الدراسات العليا المهنية في الكيمياء الحيوية
اسم المقرر: المعلوماتية الحيوية (MC525)	الدرجة: ٥٠ درجة	الزمن: ساعتان
التاريخ: ٢٠٢٤/٦/٢٣ م		



الجزء الأول (٢٠ درجة)

(١٠ درجات)

السؤال الأول :

اختر الإجابة الصحيحة واكتبها في الجدول التالي لكل من: (درجة لكل سؤال)

- ١- تعتبر قاعدة البيانات aMAZE من القواعد المتخصصة في

(أ)	المسارات الأيضية	(ب)	تتابعات البروتينات	(ج)	تتابعات الحمض النووي
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- ٢- PubMed من ضمن قواعد البيانات الخاصة ب.....

(أ)	المراجع	(ب)	تصنيف البروتينات	(ج)	الايض والانزيمات
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- ٣- ما هي قاعدة البيانات التي تُستخدم لتحليل تتابعات الحمض النووي والبروتين؟

(أ)	NCBI	(ب)	HINARI	(ج)	KEGG
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- ٤- إيجاد القطيفات Motifs تعتبر من

(أ)	مهام المعلوماتية الحيوية	(ب)	محاور المعلوماتية الحيوية	(ج)	وسائل المعلوماتية الحيوية
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- ٥- توفر قاعدة البيانات BRENDA معلومات عن.....

(أ)	تسلسل البروتينات	(ب)	تتابعات الحمض النووي	(ج)	الإنزيمات و وظائفها
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- ٦- تحليل وإيجاد الجين يعتبر من

(أ)	مهام المعلوماتية الحيوية	(ب)	محاور المعلوماتية الحيوية	(ج)	وسائل المعلوماتية الحيوية
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- ٧- إيجاد العلاقات التطورية Phylogeny يعتبر من.....

(أ)	مهام المعلوماتية الحيوية	(ب)	محاور المعلوماتية الحيوية	(ج)	وسائل المعلوماتية الحيوية
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- ٨- تنقيح التهميشات وإعادة صياغتها يعتبر من.....

(أ)	المعوقات المتعلقة بقواعد البيانات الحيوية	(ب)	المهام الأساسية لقواعد البيانات	(ج)	المحاور الأساسية لقواعد البيانات
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- ٩- PIR تعتبر من قواعد.....

(أ)	بيانات البروتينات	(ب)	بيانات خاصة بالمراجع	(ج)	بيانات خاصة بالتصنيف
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- ١٠- تطوير الأدوات والمصادر التي تساعد في تحليل البيانات تعتبر من

(أ)	مهام المعلوماتية الحيوية	(ب)	محاور المعلوماتية الحيوية	(ج)	وسائل المعلوماتية الحيوية
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إجابات السؤال الأول

السؤال	١	٢	٣	٤	٥	٦	٧	٨	٩	١٠
الإجابة										

QIII- Answer on the following.

(5 marks)

a- Explain the difference in principle of continuous and discontinuous assay of enzyme activity? (3 marks)

Continuous	Discontinuous

b-Mention FOUR enzyme catalysis the phase I of xenobiotic metabolism? (2 marks)

- 1.....
- 2.....
- 3.....
- 4.....

Good Luck!

Dr. Hossam El-Din M Omar, Prof of Animal Physiology, Faculty of Science, Assiut University

16-Amylase-AM commonly measured as marker for.....
a-Pancreas b-Acute pancreatitis c-peptic ulcer d- All are true

17-Several enzymes are used as drugs (enzymotherapy) such as.....
a-Pancreatin b-Wobenzym c-streptokinase d- All are true

18-Enzyme was used for acceleration of fibrinolysis in lungs embolization.....
a- nucleases b- collagenase c- urokinase d-pepsin

No. of Statement	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Letter of Answer																		

Q II: Choose (T) for True sentence or (F) for False sentence. (11 marks)

- 1- In electrode method for enzyme assay using a pH meter, reactions involve the production of acids where H^+ conc. is measured. ()
- 2-ALT is an enzyme that catalyzes a type of reaction (transamination) between an amino acid alanine and α -keto acid. ()
- 3- In continuous assay of ALT, the absorbance at 340nm is measured each minute without stopping the reaction, resulting in increased readings due to the oxidation of NADH. ()
- 4- In discontinuous assay of ALT, addition of acidic 2,4-dinitrophenylhydrazine (DNPH) stops the reaction and forms the 2,4-dinitrophenylhydrazone which is measured at 546nm. ()
- 5- Levels of intracellular enzymes fairly constant and low in healthy individuals. ()
- 6-c-AMP is intracellular mediator and second messenger of hormonal signal transduction via adenylate cyclase cascade. ()
- 7-Orally administered enzymes are mixtures of plant and/or animal origin enzymes. ()
- 8- Chylomicrons migrate through the Golgi to the basolateral membrane, where they are released and pass into the lymphatics. ()
- 9- Peroxisomes are specialized for carrying out oxidative reactions using molecular oxygen. ()
- 10-Pancreatin: a preparation extracted from pancreas containing various enzymes is used in deficiencies related with secretion of pancreatic enzymes as in chronic pancreatitis). ()
- 11-All enzyme assays measure either the consumption of substrate or production of product over time. ()

No. of Statement	1	2	3	4	5	6	7	8	9	10	11
True or False											

Part II

QI- Circle the correct answer for the Following Statements: (9 marks)

- 1- Hydrolysis of starch in the intestine by.....
a- protease b- amylase c- lactase d- maltase
- 2- Enzymes concerned with the Krebs cycle are found in.....
a- Ribosomes b- Mitochondria c- Nucleus d- Golgi apparatus
- 3- Digestive enzymes breakdown complex molecules by
a- Oxidation b- Hydrolysis c- Reduction d- Conjugation
- 4- Mark the CORRECT function of enzyme, Peptidase?
a) cleave phosphodiester bond b) cleave amino bonds
c) remove phosphate from a substrate d) removal of H₂O
- 5- Which of the following can be used to determine the rate of enzyme-catalyzed reactions?
a. rate of disappearance of the enzyme b. rate of disappearance of the substrate
c. rate of disappearance of the product d. change in volume of the solution
- 6- Fat is hydrolyzed by enzyme lipase to yield.....
a-Fatty acids and lipoproteins b-fatty acids and phospholipids
c-fatty acids and glycerol d-Fatty acids and triglycerides
- 7- The enzyme which hydrolysis milk sugar is.....
a-protease b-amylase c-lactase d-maltase
- 8- Luminal surface of intestinal epithelial cells contains.....that cleave oligopeptides released by pancreatic peptidases.
a-endopeptidases b- aminopeptidases c-dipeptidases d-All the above
- 9- The major site of xenobiotic metabolism is.....
a-liver b-kidney c-intestine d-spleen
- 10-Metabolism of ethanol to acetaldehyde takes place by enzymes in
a-cytosol b-peroxisome c-microsomes d- All of above
- 11-Monoamine oxidase in mitochondria metabolism the.....
a- noradrenaline b-dopamine c- amines d-All the above
- 12-Factors impact xenobiotics metabolism includes.....
a-age b-sex c- species d-All the above
- 13- Metabolic enzymes of Phase I includes.....
a- Sulfotransferases b-UDP-glucuronosyltransferases d-Glutathione S-transferases
d-All above
- 14-Different enzymes require different estimation methods depending on....
a- type of reaction catalyzed b-the nature of substrate and product
c- nature of co-enzyme d- All are true
- 15-Elevated serum ALT level are found in
a-hepatitis b-cirrhosis d-obstructive jaundice d- All are true.

- 6- 37°C-degree in the human body optimum temperature for enzymatic activities. ().
- 7- Urease enzyme was first isolated and purified in the form of crystals. ().
- 8-Enzymes are classified into six groups. ().
- 9- Group of Enzymes catalyzing reaction by elimination of H₂O called Lyases. ().
- 10-Ligases are classes of enzyme catalyzes reactions led to join two compound. ().

No.	of	1	2	3	4	5	6	7	8	9	10
Statement.											
True or False											

Question III. Write Short Notes on the following:

a- Allosteric Regulation of Enzyme Reactions (2.5 Marks).

b- Ribozymes (2.5 Marks)

Good Luck!

**Dr. A.E. El-Enany, Prof of Plant Physiology, Faculty of Science,
Assiut University**



Final Exam. For Post-Graduate Students (2nd Semester; 2023/2024)

Academic Program: Professional Diploma in Biochemistry

Course Title: Enzymology

Course Code Z 502

Date: July 2023

Total Degree: 50 Marks

Allowable Time: Two hours

Answer the following Questions (Put your answers in the provided tables).

Part (1)

Question I: Circle the correct answer for the Following Statements:(Each one Mark):

- The general mechanism is that an enzyme acts by:
 - Reducing the activation energy
 - Increasing activation energy
 - Decreasing pH value
 - Increasing the pH value
- The coenzyme is:
 - Always a protein
 - Often a vitamin
 - Often a metal
 - Always an inorganic compound
- Which of the following is produced with the combination of apoenzyme and coenzyme:
 - Prosthetic group
 - Enzyme substrate complex
 - Holoenzyme
 - Enzyme product complex
- Which one among them is the example of competitive inhibition of an enzyme:
 - Carbonic anhydrase by carbon dioxide
 - Cytochrome oxidase by cyanide
 - Hexokinase by glucose-6-phosphate
 - Succinic dehydrogenase by malonic acid
- The nature of an enzyme is
 - Protein
 - Vitamin
 - Carbohydrate
 - Lipid
- This enzyme was first isolated and purified in the form of crystals
 - pepsin
 - Urease
 - Amylase
 - Ribonuclease
- An enzyme that joins the ends of two strands of nucleic acid is:
 - Polymerase
 - Synthetase
 - ligase
 - Helicase
- Enzyme catalyzing rearrangement of atomic grouping without altering molecular weight or number of atom is:
 - Hydrolase
 - Ligase
 - Oxidoreductase
 - Isomerase
- Enzyme precursor or proenzyme is called:
 - Zymogen
 - Vitamin
 - Modulator
 - Hormone
- Enzymes catalysed reactions outside the cells called:
 - Inducible
 - Exozymes
 - Allozymes
 - Endozymes

No. of Statement.	1	2	3	4	5	6	7	8	9	10
Letter of Answer										

Question II: Choose (T) for True sentence or (F) for False sentence. Correct the wrong word whenever possible. (One Mark for each):

- Blocking of enzyme action by blocking its active site is called Allosteric inhibition ().
- Diastase takes part in digestion of Starch. ().
- Enzyme complex involved in alcoholic fermentation is Zymase. ().
- Enzymes are proteins whose three-dimensional form is key to their function. ().
- Induced fit model proposed by Koshland. ().

b. The fracture lines develop on glass that has been exposed to high heat are:

- i) wavy ii) radial iii) concentric iv) all of these

IV) Complete the unfilled spaces of the following (2 Marks)

- a) Refractive index of glass varies with small changes in
- b) Beck lines indicate that glass has higher refractive index if the white line the glass .

Part II (25 Marks)

Write short notes on

1. Forensic applications of IR/FTIR spectroscopy
2. X-ray fluorescence in forensic science
3. Applications of spectrophotometry in forensic science

Good Luck

Examiners

Prof. Dr. Aref A. M. Aly

Prof. Dr. Refaat Mahfouz

2. Micro X-ray fluorescence (μ XRF) is an elemental analysis technique that allows forensic examination of very small glass sample areas.
3. The paint data query (PDQ) database contains physical attributes, chemical composition and FT-IR spectrum for each layer of automotive paint.
4. The technique of scanning electron microscopy energy dispersive X-ray is used for identification of elemental contents of paint samples as well as studying the morphology of the paint.
5. Forensic IR analysis of paint layers is performed on midlayer to avoid surface contamination and weathering effects as well as component migration from adjoining layers.
6. Pyrograms of paint samples contain either major peaks or fingerprints that help to distinguish between very similar materials.
7. Because glass is amorphous no two glass objects will break in the same way.
8. Rollers leave parallel ream marks on sheet glass.
9. Determination of curvature can distinguish flat glass from container, decorative or ophthalmic.
10. Under UV irradiation, many glasses exhibit fluorescence caused by heavy metals, including tin from "float" process or organic coatings.

III) Choose the correct answer from the following (2 Marks)

- a. The forensic examiner must notice at the crime scene that as the bullet's velocity increases the exit hole in the glass would be:
- i. Wider than the entrance hole
 - ii. Smaller than the entrance hole
 - iii. Equal to the entrance hole

Assiut University

June 2024

Faculty of Science

Time: 3h

Final exam of course 532 C " Forensic chemistry" for Forensic diploma

Students

Part I (25 Marks)

I) Answer the following questions (11 Marks)

1. Discuss shortly the composition and characteristics that may help the forensic examiner to examine a borosilicate glass.
2. "For forensic examiner color of glass samples is important". choose three transition metal salts used for coloring glass and indicate the corresponding color of each.
3. Give the main three reagents used for microchemical tests of paints in forensic Analysis.
4. Write shortly on the three components that constitute the spray paints.
5. Indicate the main characteristics of glass fractures with respect to:
 - i. Radial cracks.
 - ii. Concentric cracks
 - iii. Rib marks with reference to the 3R rule.

II) Mark the correct sentence with ✓ and the wrong one with ✕

(10 Marks)

1. Bullet holes in glass can be distinguished from other impacts by the greater number of concentric fractures .

15. Which of the following provides the most powerful information?
- Full Factorial Design
 - Fractional Factorial Design
 - Simple Design
 - One factor at a time (OFAT) design
16. occurs when the effect of one factor on a response depends on the level of another factor(s).
- Error
 - Interaction
 - Replication
 - Randomization
17. The outcome of an experiment is called:
- Factor
 - Interaction
 - Level
 - Response
18. Which of the following is correct and most complete?
- Fractional factorial is sometimes used to give screening information and for final system choices
 - Response surface method (RSM) helps in understanding interaction effects and predicting performance
 - t-testing can, if applied with randomized experimentation, generate strong proof
 - All of the above are correct
19. Characteristics of good experimental design:
- Unbiased
 - High precision
 - Replication
 - All of the above
20. Double-blinded experiment is a scientific experiment where:
- Neither the experimenter nor the participants know who is receiving a particular treatment
 - The experimenter know who is receiving a particular treatment
 - The participants know who is receiving a particular treatment
 - Nobody has got a clue what is going on
21. factors are the factors whose effects need to be quantified.
- Primary
 - Secondary
 - Both a, b
 - None of the previous
22. is running several samples during one experimental setup for the short-term variability.
- Repetition
 - Replication
 - Factorial design
 - Randomization
23. is a specific and short-term action that will contribute to achieving a target.
- Objectives
 - Goals
 - Experiment
 - None of the previous
24. In testing the hypothesis of the experiment, reject or not the null hypothesis based on the value of the statistic test.
- Computed
 - Experimental
 - Both a, b
 - None of the previous
25. The hypothesis of the experiment allows the comparison of the two formulations in objective terms, knowing the risks associated with the conclusion.
- Correct
 - Wrong
 - Simple
 - None of the previous

Good Luck
Dr. Tharwat Mansoure

4. helps to establish priorities, choose actions and create plans.
 - a) Experiment
 - b) Strategy
 - c) Randomization
 - d) None of the previous
5. The advantage of two-sample t -test method is:
 - a) Generate a relatively accurate prediction model and may require fewer runs than one shot response surface methods
 - b) Provide a relatively high level of evidence that a single level of a single factor causes a higher average response
 - c) Provides an inexpensive way to determine which factors from a long list significantly affect system performance
 - d) None of the above
6. In the equation $Y = f(X)$, the terms X and Y are respectively:
 - a) Response, Factors
 - b) Dependent variable, Independent variable
 - c) Factors, Response
 - d) Output, Inputs
7. Why do we perform experiments in a random order?
 - a) To maximize the effect of unknown variables including environmental factors
 - b) To separate the main effects from interaction
 - c) To minimize the effect of unknown variables
 - d) To enhance the factor interactions
8. In the experimental design and hypothesis testing it is better to keep the design and analysis.....
 - a) Reversed
 - b) Measurable
 - c) simple
 - d) None of the previous
9. The role of..... is to quantify the uncertainty and increase the precision.
 - a) Repetition
 - b) Replication
 - c) Factorial design
 - d) Randomization
10. consists of all possible combinations of the factor levels.
 - a) Conclusions
 - b) Replication
 - c) Factorial design
 - d) Randomization
11. Performing the same treatment combination more than once is called:
 - a) Replication
 - b) Repatriation
 - c) Randomization
 - d) Recitation
12. On designing the experiments, to avoid bias should be performed.
 - a) Repetition
 - b) Replication
 - c) Factorial design
 - d) Randomization
13. A controlled independent variable whose levels are set by the experimenter is called:
 - a) Response
 - b) Level
 - c) Treatment
 - d) Factor
14. Consider applying design of experiments (DOE) methods for improving your personal health. Which of the following is correct and most complete?
 - a) Output responses might include weight, blood pressure, and happiness score
 - b) Randomly selecting daily walking amount each week could generate proof
 - c) Input factors might include weight, blood pressure, and happiness score
 - d) Both (a) and (b)