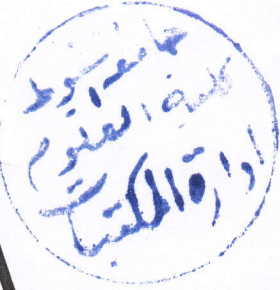


جامعة أسيوط _ كلية العلوم



إدارة المكتبات

امتحانات الفصل

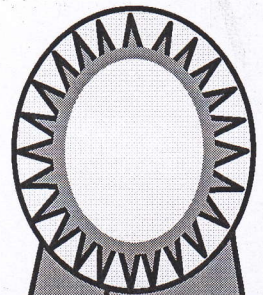
الدراسي الصيفي

للعام الجامعي

٢٠٢٣ - ٢٠٢٤ م

المكتبة العامة

الفرقة الرابعة



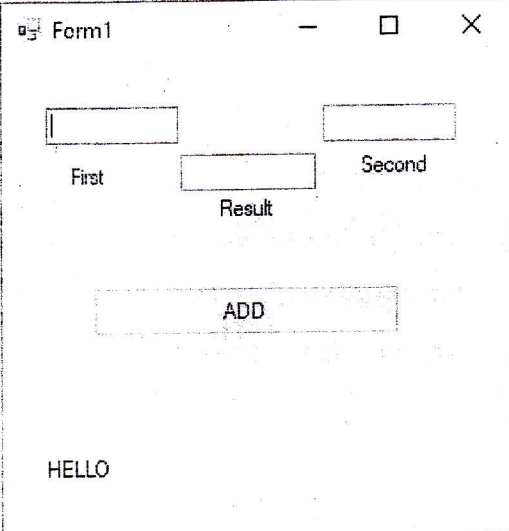
فصل في

	Assiut University Faculty of Science Mathematics Dept.	Final Exam Summer 2024 Course: Optional Course 2 Course code: MC455	Level: Fourth Time: 2 Hours Mark: 50	
FREE PALESTINE "استعين بالله ولا تعجز"				

الامتحان ست (6) صفحات - الإجابة في نفس الصفحة

Answer the following questions

Q1:



The form you see contains three text boxes named, **textBox1**, **textBox2**, and **textBox3**, with their labels **First No.**, **Second No.**, and **The Result**, respectively. Also, the form contains a single button with name **button1** and text, **ADD**. Also, label4 with text **HELLO**

Complete the subs below to make the button, **button1** take the content of the **textBox1** and **textBox2** and sum them and show the result in the **textBox3**.

Also, make the label4 with text "HELLO" to move from left side to right side of the **form1** if the content of **textBox3** exceeds the value 10. (10 Marks)

```

public partial class Form1 : Form
{
    public Form1()
    {
        InitializeComponent();
        //do not activate the timer1 tool
        .....
    }

    private void button1_Click(object sender, EventArgs e)
    {
        //assign the sum of textBox1 content and textBox2 content to the
        //textBox3 content
        .....
        .....
        .....
        //activate the timer1 tool
        .....
    }

    private void timer1_Tick(object sender, EventArgs e)
    {
        //apply the mentioned condition to move HELLO
        .....
        .....
        .....
        .....
    }
}

```

Q2: # Design the class named **Polygon** which contains the following:

(10 Marks)

- A **property** named **N** (stands for number of **sides**)
- a function named **angleSum** without parameters, to return the sum of polygon angles which given from the formula:

$$\text{sum of polygon angles} = 180 (N - 2)$$

Create new three classes named **Tri**, **Quad**, and **Pent** (مثلث ومربع ومخمس) that inherit the polygon class.

In main class:

- create one-dimensional array of three reference objects of class polygon
- make each previous reference to point an object from **Tri**, **Quad**, and **Pent** classes
- using **for** statement, compute the sum of angles of each object from **Tri**, **Quad**, **Pent** (firstly, you should assign number of sides of each object in the same **for**)

Q3: State the errors in few words, with correction:

(10 Marks)

1.

```
using System;
class Program : I1, I2
{
    static void Main(string[] args)
    {
        Program p1 = new Program();
        p1.pnt1();
        p1.pnt2();
    }
}
interface I1 { void pnt1(); }
interface I2 { void pnt2(); }
```

2.

```
using System;
public delegate void mydel(int n1);
class Program
{
    static void Main(string[] args)
    {
        mydel del;
        del = new mydel(f1);
        Console.WriteLine(del(10));
        del = new mydel(f2);
        Console.WriteLine(del(10));
    }
    public static int f1(int a) { return a * a; }
    public static int f2(int c) { return 2 * c; }
}
```

3.

```
using System;
class Program
{
    static void Main(string[] args)
    {
        person p1 = new person();
    }
}
class person
{
    string Name;
    int age;
    public person(string st, int g) { Name = st; age = g; }
}
```

4.

```
using System;
class Program
{
    static void Main(string[] args)
    {
        A a = new A();
        a.pnt();
    }
}
class A:B,C
{
}
class B
{
}
class C
{
    public void pnt() { Console.WriteLine("Class C: "); }
}
```


Q4. Suppose a is a double variable, choose the correct answers:

(10 Marks)

1. the conditional statement

$boolean\ action = a < 0 ? a > 10 ? true : false : false;$

assigns to **$action$**

- (a) **false** value if a is only positive less than or equal 10 (b) **false** value for any a .
(c) **true** value if a is only positive greater than 10 (d) None of the mentioned

2. the conditional statement

$boolean\ action = a > 0 ? a > 10 ? true : false : true;$

assigns to **$action$**

- (a) **false** value if a is any positive (b) **false** value if a is only positive less than or equal 10
(c) **true** value if a is only positive less than 10 (d) None of the mentioned

3. the conditional statement

$boolean\ action = a < 0 ? a > 10 ? false : false : true;$

assigns to **$action$**

- (a) **false** value if a is only equal zero (b) **true** value if a is any positive
(c) **true** value if a is only positive greater than 10 (d) None of the mentioned

4. the conditional statement

$boolean\ action = a < 10 ? a > 0 ? true : false : false;$

assigns to **$action$**

- (a) **false** value if a is negative (b) **false** value if a is positive greater than or equal 10
(c) **true** value if a is only positive less than 10 (d) All of the mentioned

5. the conditional statement

$boolean\ action = a > 10 ? a > 0 ? true : false : false;$

assigns to **$action$**

- (a) **false** value if a is negative (b) **false** value if a is positive less than or equal 10
(c) **true** value if a is positive greater than 10 (d) All of the mentioned

Q5: Complete the missing parts in the following program which includes the class named **point**, this class contains

- two fields named **Xcoord** and **Ycoord**.
- constructor with two arguments to initialize the fields.
- the function named **dist()** with a single argument from the **point** type, and return the distance between two objects from the class **point**. $\text{dist}(p1, p2) = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$ if $P_1(x_1, y_1)$, $P_2(x_2, y_2)$
- in the **Main** function, create the two objects **P1** and **P2** with optional initial values and call the function **dist()** by the second object to compute the Euclidean distance between the two points and print the result. **(10 Marks)**

Remark: use the functions **Math.sqrt()** to compute the square root, **Math.pow()** to compute the 2 power.

```
using System;
class Program
{
    static void Main(string[] args)
    {
        point p1 = .....; //create p1 object
        point p2 = .....; //create p2 object
        Console.WriteLine(.....); //call dist() function
    }
}
class point
{
    double Xcoord;
    double Ycoord;
    public point(double X, double Y)
    {
        .....
        .....
        .....
    }
    public double dist(point S)
    {
        .....
        .....
        .....
        .....
    }
}
```

End of Exam, with my best wishes:
Dr- Abdel-Rahiem Ahmed Hashem Mohammed

د. عبدالرحيم احمد هاشم محمد

	Assiut University Faculty of Science Mathematics Dept.	Final Exam Summer 2024 Course: Neural Networks Course code: MC459	Level: Fourth Time: 2 Hours Mark: 50	
---	--	---	--	---

FREE PALESTINE

"استعين بالله ولا تعجز"

الامتحان أربع (4) صفحات - الإجابة في نفس الصفحة

Answer the following questions

Question 1: State the terminology of these definitions (10 Marks)

1. Type of machine learning where the model is trained on labelled data.
(.....)
2. Type of machine learning where the model is trained by interacting with an environment and receiving feedback. (.....)
3. Type of errors occurs when the model incorrectly predicts the positive class when the actual class is negative. (.....)
4. Type of errors occurs when the model incorrectly predicts the negative class when the actual class is positive. (.....)
5. Kind of knowledge where the goal is to predict a categorical label for a unknown input. (.....)

Question 2: Consider the following four points in two dimensions and its label;

$P_1([1, 5]^t, 1)$, $P_2([2, 4]^t, 1)$, $P_3([3, 1]^t, 0)$, $P_4([4, 2]^t, 0)$ **(10 Marks)**

1. Classify these points into two classes using linear decision boundary pass through (2, 2) and (3, 4), label the classes with +ve class and -ve class, show your answer using graph.
2. Choose the weight vector that is orthogonal to the decision boundary.
3. Use the decision function to classify the points (1, 2) and (4, 4)

Question 3: Let's consider the binary classification problem where we want to train a perceptron to distinguish between two classes based on two features.

(10 Marks)

Feature 1 (X1)	Feature 2 (X2)	Target (Y)
0	0	0
0	1	0
1	0	0
1	1	1

Take the initial weights w_1 , w_2 and bias b , also learning rate η as follow:

$(w_1, w_2, b) = (0, 0, 0)$, $\eta = 1$, n is the iteration number

Consider the following activation function (step function):

$$F(s) = \begin{cases} 1; & \text{if } s \geq 0 \\ 0; & \text{if } s < 0 \end{cases} \quad \text{where } s \text{ is the weighted sum}$$

Choose the correct answer:

- For $n = 0$ where the input $(x_1, x_2) = (0, 0)$ and desired output $Y = 0$, the values of s and practical output are equal, respectively:
 (a) -1, 0 (b) 1, 0 (c) 1, 1 (d) 0, 1
- For $n = 0$ where the input $(x_1, x_2) = (0, 0)$, the new weights (w_1, w_2, b) are:
 (a) (0, 0, 0) (b) (1, 0, 0) (c) (1, 1, -1) (d) (0, 0, -1)
- For $n = 1$ where the input $(x_1, x_2) = (0, 1)$ and desired output $Y = 0$, the values of s and practical output are equal, respectively:
 (a) 0, 1 (b) 1, 0 (c) 1, 1 (d) -1, 0
- For $n = 1$ where the input $(x_1, x_2) = (0, 1)$, the new weights (w_1, w_2, b) are:
 (a) (0, 0, 0) (b) (1, 0, 0) (c) (1, 1, -1) (d) (0, 0, -1)
- For $n = 2$ where the input $(x_1, x_2) = (1, 0)$ and desired output $Y = 0$, the values of s and practical output are equal, respectively:
 (a) -1, 0 (b) 1, 0 (c) 1, 1 (d) 0, 1
- For $n = 2$ where the input $(x_1, x_2) = (1, 0)$, the new weights (w_1, w_2, b) are:
 (a) (0, 0, -1) (b) (1, 0, 0) (c) (1, 1, -1) (d) (0, 0, 0)

7. For $n = 3$ where the input $(x_1, x_2) = (1, 1)$ and desired output $Y = 1$, the values of s and practical output are equal, respectively:

- (a) -1, 0 (b) 1, 0 (c) 1, 1 (d) 0, 1

8. For $n = 3$ where the input $(x_1, x_2) = (1, 1)$, the new weights (w_1, w_2, b) are:

- (a) (1, 1, 0) (b) (1, 0, 0) (c) (1, 1, -1) (d) (0, 0, -1)

9. For $n = 4$ where the input $(x_1, x_2) = (0, 0)$ and desired output $Y = 0$, the values of s and practical output are equal, respectively:

- (a) -1, 0 (b) 0, 1 (c) 1, 1 (d) -1, 1

10. For $n = 4$ where the input $(x_1, x_2) = (0, 0)$, the new weights (w_1, w_2, b) are:

- (a) (1, 1, 0) (b) (1, 1, -1) (c) (1, 0, 0) (d) (0, 0, -1)

Question 4: A new classifier is developed to detect a certain disease. Out of 100 people tested, 80 people have the disease, and 20 people do not.

The classifier correctly identifies 70 out of the 80 people who have the disease, and incorrectly identifies 5 people as having the disease when they do not.

Also, the classifier correctly identifies 15 people who do not have the disease, and fails to identify 10 people who actually have the disease.

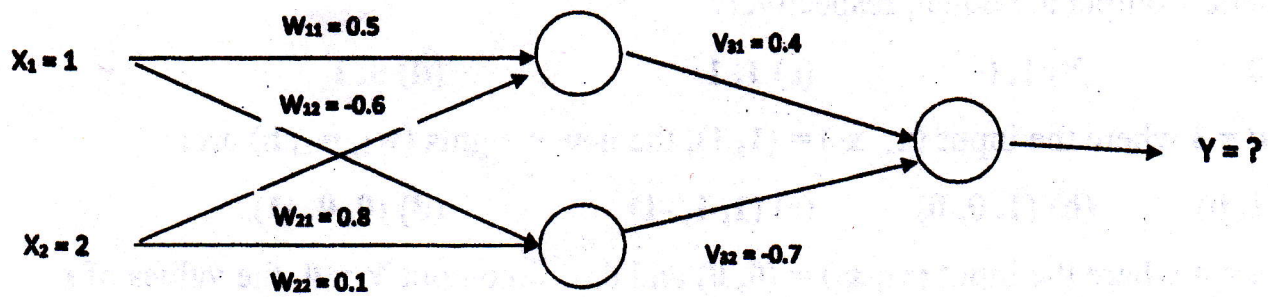
What is the number of True Positives (TP), False Positives (FP), True Negatives (TN) and False Negatives (FN)?

Question 5:

Consider the following multilayer perceptron with two basic inputs X_1 and X_2 , additional input (biased) for the first hidden neuron $b_1 = 0.1$ and the additional input (biased) for the second hidden neuron $b_2 = -0.3$, also, the biased for the output neuron $b_3 = 0.2$

$$f(x) = \frac{1}{1 + e^{-x}}$$

Consider the activation function:



Compute the final output Y ?

End of Exam, with my best wishes:

Dr- Abdel-Rahiem Ahmed Hashem Mohammed

د. عبدالرحيم احمد هاشم محمد

	Assiut University Faculty of Science Mathematics Dept.	Final Exam Summer 2024 Course: Data Mining Course code: MC464	Level: Fourth Time: 2 Hours Mark: 50	
FREE PALESTINE				

"اسْتَعِزْ بِاللّٰهِ وَلَا تَفْجَزْ"

الامتحان خمس (5) صفحات - الإجابة في نفس الصفحة

Question 1: State the terminology of these definitions (10 Marks)

1. Summarization of the general characteristics or features of a target class of data.
(.....)
2. It is a numeric attribute with an inherent zero-point or absolute zero.
(.....)
3. A special case of nominal attribute has two only values.
(.....)
4. A statistical measure which its major problem is its sensitivity to extreme (e.g., outlier) values.
(.....)
5. Kind of knowledge shows the probability of relationships between data items, within large data sets.
(.....)

Question 2: Put True or False for each of the following items (20 Marks)

عَلِّم إجابتك بالجدول المرفق في نهاية الإمتحان

1. The dissimilarity between $X = (\text{blue}, A)$ and $Y = (\text{red}, A)$ is 0.5 where the attributes described X and Y are nominal.
2. In **Apriori** techniques, we do not consider the super set if at least one of its sub sets not frequent.
3. In some experience, we measure the length of students, this length variable is considered ration-scale variable.
4. Classification is considered a predictive model.
5. The confidence c of the rule $A \rightarrow B$ is the percentage of transactions in data set containing A that also contain B .
6. Bayesian classifier is a class of learning algorithm that tries to find an optimum classification of a set of examples using the probabilistic theory.
7. Data integration is the process of combining multiple data sources in a single database.
8. Regression tends to predict the class label when these labels represent infinite and uncountable values.
9. A major problem with the mean as a statistical representing is its sensitivity to extreme/outlier values.
10. Frequent sequential pattern occurs when customer tend to purchase first something, followed by purchase another something.

11. Outlier values are always discarded in outlier analysis.
12. We can compute the basic central tendency measures except the mean value for the Nominal attribute.
13. Information is an interesting pattern which has meaningful use.
14. The information is the output of the KDD process.
15. Midrange and range are dispersion Measures.
16. When the data distribution is symmetric, the mean, median, and mode are the same value.
17. The value of median is less than the mean when the data is skewed positively.
18. When the data distribution is positively skewed, Small values are more than large values.
19. If an attribute is not discrete, it is continuous.
20. Training data are data objects for which the class labels are known.

Question 3: Choose the correct answer (10 Marks):

عَلِّم رَقْمَ إِجَابَتِكَ بِالْجَدُولِ الْمَرْفُوقِ فِي نَهَايَةِ الْإِمْتِحَانِ

1. The process carried out to isolate the human objects from scene images is called
 - a) Classification
 - b) Clustering
 - c) Characterization
 - d) mining frequent pattern
2. The entropy of this set $S_1 = \{A, A, A, B, B\}$ is
 - a) $\text{Ent}(S_1) = 0.971$
 - b) $\text{Ent}(S_1) = 0.651$
 - c) $\text{Ent}(S_1) = 0.918$
 - d) None of above
3. we can compute the basic central tendency except the mean value for the ...
 - a) Ratio-scale attribute
 - b) Ordinal attribute
 - c) Nominal attribute
 - d) Interval-scale attribute
4. The dissimilarity between the two examples $x = (1,0,0,0,0,0,0,0,0,0)$ and $y = (0,0,0,0,0,0,1,0,0,1)$ where the ten attributes are symmetric binary
 - a) 0
 - b) 0.3
 - c) 0.1
 - d) 3.5
5. The similarity between the two examples $x = (0,1,1,1,0,0,0,0,0,0)$ and $y = (0,0,0,0,0,0,1,0,1,1)$ where the ten attributes are symmetric binary
 - a) 0
 - b) 0.4
 - c) 0.1
 - d) 0.7

6. If we have the following list $A = (9 \ 20 \ 2 \ 13 \ 8 \ 12 \ 4)$, the value of IQR (Interquartile range) is
a) 9 b) 4 c) 15 d) 6
7. The entropy of this set $S_1 = \{A, A, A\}$ is
a) $\text{Ent}(S_1) = 0.0$ b) $\text{Ent}(S_1) = 0.651$
c) $\text{Ent}(S_1) = 0.5$ d) $\text{Ent}(S_1) = 1.0$
8. The dissimilarity between $X = (\text{blue}, \text{Code A}, \text{farmer})$ and $Y = (\text{red}, \text{Code A}, \text{doctor})$ is
a) 0.66 b) 0.0
c) 0.33 d) 1.0
9. For the list $A = (9 \ 20 \ 2 \ 13 \ 8 \ 12 \ 4)$, which of the following is correct?
a) $Q2 = \text{IQR}$ b) $Q2 = Q1 + Q3$
c) $\text{Range} < \text{IQR}$ d) None of the mentioned
10. Celsius temperatures can measure through
a) Interval-scale attribute b) Ration-scale attribute
c) Ordinal attribute d) Nominal attribute



Important
remarks

- No. of pages: 2 – Solve in a table (write only A, B, C, or D).
- Two points to each answer.

Choose the correct answer

(50 points)

1. What is the ciphertext for the plaintext "CRYPTOGRAPHY" using a Rail Fence cipher with a depth of 3?
- A) CYORGPHRTA - B) CTOGRYPRAH - C) CTYROGPRAH - D) CPYORHTARG
2. In a Rail Fence cipher with 4 rails, how is the message "SECURITY" encrypted?
- A) SRTUECYI - B) SREUITCY - C) SECIURYT - D) STEIYCRU
3. What would be the plaintext for the Rail Fence ciphertext "WECRLTEERDSOEFEAOCAIVDEN"? Assume 3 rails.
- A) WLREAINERTEDOEEAOVECESF - B) WECRDISCOVEREDAFEETONCE
- C) WECRAREDISCEFLEETONCE - D) WEAREDISCOVEREDTONCE
4. In a columnar transposition cipher, what is the key used to encrypt the plaintext "HELLO" as "HLEOL"?
- A) 2 3 1 - B) 3 1 2 - C) 1 3 2 - D) 2 1 3
5. If the key is "3142", what is the columnar transposition of "ATTACKATDAWN"?
- A) TAAACKTADAWN - B) TKAATNACDTAW - C) CATDAWK TAN - D) TADA ACTAKWN
6. For the key "4231" and plaintext "CRYPTOGRAPHY", what is the resulting ciphertext using a columnar transposition cipher?
- A) PRYROPYGHCTA - B) CTYPOGHRARPY - C) CYTHROGPARYP - D) CHPRGYOTARYP
7. In a simple substitution cipher, how many possible keys can be used?
- A) 26! - B) 26 - C) 52! - D) 52
8. If the plaintext "HELLO" is encrypted to "URYYB" using a simple substitution cipher, what is the key used?
- A) ROT13 - B) ROT5 - C) ROT7 - D) ROT10
9. Using a simple substitution cipher with the key "ZEBRASCDFGHIJKLMNOPQTUVWXY", what is the ciphertext for the plaintext "CRYPTO"?
- A) BFANQL - B) VFTNOM - C) TFAMON - D) BOYMQ L
10. Given a simple substitution cipher where "A" is substituted with "D", "B" with "E", and so on, what is the ciphertext for "ATTACK"?
- A) DUUDFK - B) DWWDLK - C) DUUDCL - D) DWT DCL
11. What is Ciphertext of the plaintext "MIDSEMEXAM" if it is encrypted using Playfair cipher? Where the key is "QUARANTINE"
- A) WFKLIOAGLO - B) FWLKIOAGOL - C) WFLKLILOAG - D) FWKLAGLOIO
12. Using the Playfair cipher with the key "MONARCHY", how is the pair "HI" encrypted?
- A) MA - B) FB - C) BF - D) EM
13. In the Playfair cipher, if the digraph is "BM" and the key is "KEYWORD", what is the encrypted form?
- A) CN - B) QR - C) OE - D) RQ
14. If the plaintext is "HELLO" and the key is "XMCKL", what is the ciphertext using a one-time pad cipher?
- A) EQNVZ - B) MFNVS - C) VRBQR - D) AXTQM

15. In a one-time pad cipher, if the key is "KEY" and the plaintext is "ATTACK", what is the ciphertext?
 - A) KFNZBR - B) NJYLZR - C) LHZCPX - D) None of the above
16. What is the ciphertext for the plaintext "HELLO" using the Vigenère cipher with the key "KEY"?
 - A) RIJVS - B) QNXEP - C) XDRJH - D) JBGFC
17. In the Vigenère cipher, if the key is "LEMON" and the plaintext is "ATTACK", what is the ciphertext?
 - A) LXFOPV - B) RXFPVF - C) NXHLZZ - D) LXFPFV
18. Which cipher is a polyalphabetic substitution cipher that extends the Caesar cipher?
 - A) Vigenère - B) Playfair - C) One-time Pad - D) Columnar Transposition
19. What is the decryption of the Vigenère ciphertext "EQNVZ" with the key "XMCKL"?
 - A) HELLO - B) WORLD - C) HANDS - D) DEFEND

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
B	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A
C	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B
D	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C
E	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D
F	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E
G	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F
H	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G
I	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H
J	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I
K	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J
L	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K
M	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L
N	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M
O	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N
P	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Q	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
R	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
S	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
T	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
U	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
V	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
W	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
X	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
Y	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Z	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y

20. In the context of the knapsack cryptosystem, consider a superincreasing sequence $S = (1, 2, 4, 8, 16)$, modulus $n = 31$, and multiplier $m = 3$. If the plaintext is "10101", what is the corresponding ciphertext?
 - A) 28 - B) 24 - C) 26 - D) 18
21. Given a superincreasing sequence $S = (2, 3, 7, 14)$, a modulus $n = 20$, and a multiplier $m = 11$, what is the public key sequence?
 - A) (22, 33, 77, 154) - B) (2, 5, 11, 9) - C) (2, 1, 13, 14) - D) (22, 13, 17, 14)
22. If the public key sequence in a knapsack cryptosystem is (17, 25, 6, 11, 30) and the ciphertext is 58, which of the following plaintexts corresponds to this ciphertext?
 - A) 10110 - B) 11001 - C) 01101 - D) 10011
23. In an RSA encryption system, if the public key components are ($n = 77$) and ($e = 13$), what is the ciphertext for the plaintext message ($m = 7$)?
 - A) 17 - B) 56 - C) 34 - D) 19
24. Given the RSA parameters ($p = 11$), ($q = 13$), and ($e = 7$), what is the modulus (n)?
 - A) 143 - B) 121 - C) 140 - D) 156
25. If the RSA public key is ($n = 55$) and ($e = 3$), what is the ciphertext for the plaintext ($m = 10$)?
 - A) 10 - B) 40 - C) 35 - D) 25

	Assiut University Faculty of Science Mathematics Dept.	Final Summer 2024 Course: Distributed Computing Course code: MC 462	Level: Fourth Time: 2 Hours Mark: 50 Points	
---	--	--	---	---

FREE PALESTINE

"استعين بالله ولا تعجز"

الامتحان خمس (5) صفحات - الإجابة في نفس الصفحة

Question No. 1: Put True or False:

(10 Marks)

1. One of the most disadvantages off Amdahl law is its ignoring the communication time (.....)
2. The maximum speedup we achieved using Amdahl law is the same value of serial fractional f (.....)
3. In parallel computing system, there is a local memory belongs each CPU. (.....)
4. Parallel computing is the use of a parallel computer to reduce the time needed to solve a single computational problem. (.....)
5. A parallel computer is a multiple-processor computer system supporting parallel programming (.....)
6. In distributed computing system, there is a local memory belongs each CPU. (.....)
7. The concurrency is the operations that may be performed in parallel. (.....)
8. The primary reason for the poor speedup when experimentally determined serial fraction e does not change with increasing number of processors is the communication time. (.....)
9. The primary reason for the poor speedup when experimentally determined serial fraction e increases as the number of processors increasing is parallel overhead. (.....)
10. The maximum speedup we achieved using Amdahl law is $1/f$, where f is the serial fraction. (.....)

Question No. 2: Choose the correct answer:

(10 Marks)

1. If different functions apply to different or same data, this is called
 - a) Functional Parallelism
 - b) Data Parallelism
 - c) Data clustering
 - d) Data Dependence Graphs
2. Allow only one message at a time to be sent
 - a) Cluster media
 - b) Shared media
 - c) Distributed media
 - d) Switched media

3. Which is better?

- a) low diameter, low bisection width
- b) high diameter, high bisection width
- c) low diameter, high bisection width
- d) high diameter, low bisection width

4. In a 2-D mesh switch network, the value of bisection width is given from

- a) $n \log n$
- b) $\log n$
- c) $n/2$
- d) $\sqrt{n}$

5. Parallelism in the following sub code

```
For i = 0 to 99 do
    c[i] = a[i] + b[i]
Endfor
```

is considered

- a) Data Parallelism
- b) Function Parallelism
- c) Pipelining
- d) None of them

6. which of the following is not a tool to explore the parallelism

- a) Data Dependence Graphs
- b) Data Parallelism
- c) Functional Parallelism
- d) Data clustering

7. In which of the following, new operations adding to allow users to express parallelism

- a) Extend an existing compiler
- b) Define a new parallel language
- c) Add a new parallel language layer
- d) Extend an existing language

8. In a binary tree switch network, if 8 is the number of processors then the diameter is

- a) 9
- b) 4
- c) 6
- d) 3

9. In a hypercube switch network, if 8 is the number of processors then the diameter is

- a) 5
- b) 4
- c) 3
- d) 6

10. Which of them is not step in Ian Foster methodology

- a) agglomeration
- b) partitioning
- c) Selection
- d) communication

Question No. 3: State the terminology:

(10 Marks)

1. It support point-to-point messages among pairs of processors.
(.....)
2. It can degrade the performance of a heavily utilized shared medium.
(.....)
3. It is a well-known example of a shared medium.
(.....)
4. The graph which each node represents processor or switch and edge represents communications path.
(.....)
5. It is a classification scheme of parallel computers depends on the parallelism exhibits in its instruction stream and its data stream.
(.....)
6. It is the minimum number of edges between switch nodes that must be removed in order to divide the network into two halves.
(.....)
7. The largest distance between two switch nodes.
(.....)
8. Process of dividing the computation and data into pieces in Foster model.
(.....)
9. Type of communication where significant number of the primitive tasks must contribute data to perform a computation.
(.....)
10. Process of grouping tasks into larger tasks in order to improve performance or simplify programming in Foster model.
(.....)

(20 Marks)

processors?

spent in serial code if it is to achieve a scaled speedup of 7 on 8 processors?

c) Consider the following data which represent the speedup ψ and corresponding number of processors p :

p	2	3	4	5	6	7	8
ψ	1.8	2.5	3.1	3.6	4.0	4.4	4.7

1. Compute the experimental serial fraction e for each number of processor and corresponding speedup (state the used formula for computing e).
2. Why the speedup is limited in comparison of the number of used processors?

End of Exam, with my best wishes:

Dr- Abdel-Rahiem Ahmed Hashem Mohammed

د. عبدالرحيم احمد هاشم محمد

Department of Mathematics		قسم الرياضيات
Faculty of science		كلية العلوم
الاختبار النهائي في مقرر المرونة و الهيدروديناميكا		
الدرجة: 50	الفصل الدراسي الصيفي 2024-2023	المستوى الرابع كلية العلوم
الزمن :ساعتان	7/9/2024	كود المقرر: 431 ر

اجب عن الاسئلة الاربعة الاتية:

السؤال الاول:

أ- استنتج شكل مجسم الاجهادات (سطح كوشي) في الحالة العامة و عندما تكون المحاور اساسية. (8 درجات)

ب- استنتج مصفوفتي الانفعالات الناتجة من التشوه الحادث لعنصر حجم ما. (8 درجات)

السؤال الثاني:

استنتج المعادلات الاساسية لحل مسائل نظرية المرونة (معادلات لامي). (9 درجات)

السؤال الثالث :

أ- وضح بالتعريف و الرسم (ان امكن) الفرق بين: (8 درجات)

(i) السريان الطبقي و السريان الاضطرابي، (ii) الحركة المستقرة و الغير مستقرة،

(iii) مدخل اويلر و مدخل لاجرانج في دراسة الموائع، (iv) الخطوط المسارية و الانسيابية.

ب- اذا كان متجه السرعة لمائع غير قابل للانضغاط $\vec{q} = (-\omega y, \omega x, 0)$ حيث ω

ثابت. اثبت ان الحركة ممكنة و بين ما اذا كانت جهدية من عدمه و ارسم خطوط

الانسياب. (8 درجات)

السؤال الرابع :

استنتج معادلة اويلر الاتجاهية في الصورة العامة لحركة مائع ثم استخرج

معادلة برنولي لمائع غير قابل للانضغاط و بين صورتها في حالة الحركة

الجهدية و الحركة المستقرة. (9 درجات)

مع أطيب التمنيات بالنجاح والتوفيق ،،، د/ محمد أحمد يوسف

الاختبار النهائي للفصل الدراسي الصيفي العام الجامعي: 2023 م / 2024 م الفرقة: الرابعة - قسم الفيزياء - كلية العلوم		جمهورية مصر العربية وزارة التعليم العالي - جامعة اسيوط كلية العلوم - قسم الرياضيات
درجة الاختبار: 50 درجة الزمن: 120 دقيقة (ساعتين)		اسم المقرر: تحليل رياضي يوم: الخميس مدرج: 9
أستاذ المقرر: د. أيمن شحاته محمد	التاريخ 2024/9/5 م	رقم المقرر: MATH 419

مستعينا بالله أجب عن خمسة أسئلة فقط من الأسئلة الآتية:

السؤال الأول: (10 درجات-3+3+4)

(1) أثبت أن $\sqrt{3}$ عدد غير قياسي.

(2) أحسب النهايات التالية (i) $\lim_{x \rightarrow 0} \frac{1 - \cos(x)}{x \sin(x)}$ (ii) $\lim_{x \rightarrow 0} \frac{(1+x)^5 - 1}{\sqrt{1+x} - 1}$

(3) إذا كانت $S = \left\{ \frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \dots \right\}$ أوجد $\min S, \max S, \inf S, \sup S$.

السؤال الثاني: (10 درجات-3+3+4)

(1) أثبت أن المتتابعة التي حدها النوني: $x_n = \frac{(-1)^n + 2}{n}$ تقاربية إلى الصفر.

(2) أثبت أن الدالة $f(x) = \sqrt{2+x}$; $x \geq -2$ تزايدية.

(3) احسب قيم التكاملات التالية (i) $\int_{|z|=1} \frac{e^{2z}}{z^3} dz$ (ii) $\oint_{|z|=1} e^z dz$ (iii) $\int_{|z|=2} \frac{1}{(z+1)^3} dz$

السؤال الثالث: (10 درجات-3+3+4)

(1) عين قيمة a بحيث تكون الدالة: $f(x) = \begin{cases} \frac{x^4 - 1}{x - 1}, & x \neq 1 \\ a, & x = 1 \end{cases}$ متصلة عند $x = 1$.

(2) باستخدام تعريف مشتقة، أوجد المشتقة الأولى للدالة $f(x) = \sqrt{x}$.

(3) أثبت أن الدالة $f(x) = x^2$ منتظمة الاتصال في المنطقة $|x| < 1$.

السؤال الرابع: (10 درجات-3+3+4)

(1) ادرس قابلية الدالة للتفاضل $f(z) = \operatorname{Re}(z)$ عند أي نقطة في المستوي المركب.

(2) برهن أن الدالة $u = e^{-y} \cos x$ توافقية.

(3) اكتب بدون برهان شرطا ضروريا وكافيا كي تكون الدالة تحليلية ثم استخدمه في إثبات أن $f(z) = e^z$ دالة تحليلية.

السؤال الخامس: (10 درجات- لكل خطوة 2 درجة)

ضع علامة صح (✓) أمام العبارة الصحيحة وعلامة خطأ (X) أمام العبارة الخاطئة: (5 درجات)

1. إذا كان z_1, z_2 عدنان مركبان هل التعبير التالي صحيح في حقل الأعداد المركبة $|z_1| < |z_2|$. (.....)

2. هل العلاقة التالية " $n \log z = \log z^n$ " صحيحة بصفة مطلقة. (.....)

(1)

3. هل العلاقات الآتية محققة في التحليل المركب $|\sin z|$ or $|\cos z| \leq 1, \forall z$. (.....)
4. يتساوى العددين المركبان إذا وإذا فقط تساوت كل من مركبتيهما كل على حدة. (.....)
5. إذا كان z_1, z_2 عددين مركبان هل التعبير التالي صحيح في حقل الأعداد المركبة $z_1 < z_2$. (.....)

السؤال السادس: (10 درجات - لكل فترة 2 درجة)

اختر الإجابة الصحيحة من بين الإجابات الآتية ثم انقلها إلى كراسة الإجابة: (10 درجات)

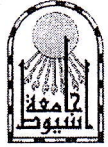
- (1) قيمة المقدار i^{18} تساوي (i) i (ii) $-i$ (iii) 1 (iv) -1 (v) $-2+3i$
- (2) إذا كانت $z = 2-3i$ فإن مرافق العدد z هو (i) $2-3i$ (ii) $3-2i$ (iii) $2+3i$ (iv) $-2+3i$
- (3) إذا كانت $z = 3+4i$ فإن القيمة المطلقة للعدد المركب $|z|$ هي (i) 4 (ii) 3 (iii) 5 (iv) $3-4i$
- (4) إذا كانت $z = -2$ فإن الصورة القطبية هي (i) $2i$ (ii) $2 \operatorname{cis}(\pi)$ (iii) $2 \operatorname{cis}\left(\frac{3}{2}\pi\right)$ (iv) 2
- (5) إذا كانت $z = e^{i\theta}$ حيث θ هي السعة للعدد المركب فإن القيمة المطلقة $|z|$ هي (i) 1 (ii) -1 (iii) i (iv) $-i$

د. أيمن شحاته محمد

انتهت الأسئلة مع أطيب التمنيات بالتوفيق والنجاح

ف

الان

 كلية العلوم جامعة أسيوط	الإمتحان النهائي للفصل الدراسي الصيفي للعام الدراسي (2024-2023) تفكير علمي (14 م.ج)		 جامعة أسيوط
كلية العلوم	لطلاب بكالوريوس العلوم التاريخ : 2024/8/27	الوقت الممتاح ساعتان	جامعة أسيوط

السؤال الأول : ضع علامة صح (✓) أو خطأ (×) في الجدول المرفق أسفل الأسئلة..... (30 درجة)

1	التفكير في أن القمر يظهر مساء لينير الطريق هي من الملحوظات المأخوذة على سبيل الاستقراء
2	قسم أفلاطون البشر إلى محبي الكسب ، و محبي الشهرة ، و محبي العلم و المعرفة
3	التفكير الخرافي هو التفكير الذي يقوم على إنكار العلم ورفض مناهجه
4	التحديد الكمي للملاحظات كان من سمات علماء العرب
5	بدأ الأوروبيون نهضتهم العلمية بترجمة المؤلفات العربية
6	تتخصص متعة العالم في معرفة المتخصصين بقيمة عمله و ليس من خلال الشهرة السطحية
7	كان أنوبيس أحد أبطال اسطورة بدعها قدماء المصريين لمحاولة تفسير فيضان النيل
8	برعت الحضارات القديمة في استخدام المعارف و التحليل العقلي
9	يبدأ البحث العلمي ملاحظة الظواهر المراد دراستها ثم تحديد طرق الدراسة و وضع الخطة
10	التجارب الأولية و التأكيديية هم مراحل بحثية تلي الاستنباط العقلي لقاعدة رياضية عامة
11	شهد فلاسفة الإغريق جميعا بأهمية أثر الحضارة الفرعونية على نضج حضارتهم
12	ظهور الفكر الإسلامي نجح في إخفاء نظرية العناصر الأربعة اليونانية تماما
13	تم التوصل إلى التكنولوجيا بالصدفة عن طريق التجربة أخطاء من الإلهام العبيثي
14	تفترض النظرة التقليدية لنمو العلم أن الشعوب تكسب الخبرات دون الإعتماد على النظريات
15	يعد استقاء المعارف من خلال الإنجازات العلمية ووفقا على أرض صلبة أمام العلم
16	تنتج القوانين الجزئية من التجارب العملية و تربط بين الظواهر الطبيعية
17	اعتبر الإغريق علم الحيوان و النبات من العلوم الدنيا
18	ظل مبدأ حيوية الطبيعة راسخا في أذهان العلماء الأوروبيون حتى أواخر القرن 19
19	نبه ديكارت و بيكن الأذهان إلى ملاحظة الواقع و صياغة القوانين الرياضية
20	الخشوع للسلطة الفكرية هي أحد العقبات التي نبتت عن إيمان بعض المفكرين بأن الخيال أو الحدس هما القوى المحركة للبشر
21	كان التفكير الأسطوري ينظم الأحداث المتشابهة حول الإنسانية لينتقي ما يهم كل متخصص في مجاله
22	سيطر التعصب الديني على الفكر الإغريقي و الأوروبي
23	تفوقت الحضارة المصرية القديمة في علوم الفلك بينما فعلت الحضارة البابلية ذلك في علوم الحيوان و النبات
24	تشابكت علوم الفلسفة و الفلك عند اليونانيين القدماء و ذابت الفواصل بينها
25	تفوق قدماء المصريين في التحنيط هو نتاج فكرة حاجة الآلهة للخلود
26	دائما ما يؤدي الاعلام المباشر إلى نهضة عقلية عظيمة لكل الشعوب
27	ظهرت حضارة قدماء المصريين نتيجة تراكم الخبرات و الثقافات
28	اعترف أفلاطون بفضل الحضارة الفرعونية على الحضارة اليونانية
29	التكنولوجيا هي كل الأدوات و الوسائل التي يستخدمها البشر لأغراض عملية تطبيقية
30	انهيار مبدأ العلم لأجل العلم في بداية العصر الحديث و حل محله مبدأ تداخل العلم و الأخلاق

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.

 كلية العلوم جامعة أسيوط	الإمتحان النهائي للفصل الدراسي الصيفي للعام الدراسي (2024-2023) تفكير علمي (14 م.ج)		
كلية العلوم	لطلاب بكالوريوس العلوم التاريخ : 2024/8/27	الوقت المتاح ساعتان	جامعة أسيوط

السؤال الثاني : اختر الاجابة الصحيحة للعبارة التالية (20 درجة)

31	أحد العقبات في طريق تقدم العلم و الذي نبع عن إيمان بعض المفكرون بأن الخيال أو الحدس هما القوى المحركة للبشر	A أنكار قدرة العقل	B الخضوع للسلطة الفكرية	C الرغبة و التمني	D التعصب
32	تواصل أو تفاعل شيق بين شخصين بشكل عفوي يعتمد على الاحترام و عدم التعدي أو التعصب	A النقد	B الحوار	C النقاش	D الجدل
33	منهج العلم يلجأ إلى الدليل و البرهان الموضوعي للإقناع في شكل	A الإستقراء العملي	B إجراء تجربة تثبت المبدأ	C جمع البيانات و ترتيبها	D وضع قاعدة رياضية عامة
34	نظر أفلاطون و أرسطو إلى العلم على أنه	A دمج العلم بالإيمان	B تفسير للنتائج	C تأمل محض	D حل لمشاكل الحياة
35	الوصول مباشرة إلى نتيجة مطلوبة في خطوة واحدة بدون استدلال أو استنباط	A حدث عاطفي	B حدس فني	C حدس عقلي	D حدس حسي
36	مهارة ضرورية يمكن من خلالها تنمية العلاقات الاجتماعية يقرب وجهات النظر بهدف الوصول للحقيقة	A الحوار	B النقاش	C الحديث الهادف	D التواصل بين العلماء
37	مصطلح يصف وقوف العالم خارج نطاق القيم الأخلاقية مما قد يسبب حدوث بعض الشرور	A انعدام الأخلاق	B اللااخلاق	C نزاع الأخلاق	D العالم الشرير
38	هو طريقة تفكير الفنان تظهر فجأة في ذهنه لتتحول إلى عمل فني كاللوحة الفنية مثلا	A العاطفة	B الإلهام	C الإحساس	D إعمال العقل
39	صفة من صفات العلماء تفترض أن يسعى عملهم العلمي لإبراز الحقيقة وحدها و تجنب الأهواء الشخصية	A الحيادية	B النقد	C الأمانة	D النزاهة
40	يعتبر العلم نشاطا عقليا يقوم به علماء مُتخصِّصون، ويتَّخذ طابعاً لا شخصياً لأنَّ	A العلوم تختلف عن الأساطير	B العلوم ليست اشخاصا	C نتائجه تصبح ملكا للآخرين	D العلم ليس حيا
41	ترجع اسباب انتشار الفكر الاسطوري إلى انه	A كان مناسباً تماماً لتفكير العلماء	B كان يقدم تفسيراً دقيقاً للظواهر	C كان يجمع بين الطبيعة و الآلهة	D كان يعبر عن نظرة الشعوب للظواهر
42	يتسم البحث العلمي في العصر الحديث أن البحوث الأساسية سرعان ما تتحول إلى	A مؤتمرات دولية	B تكنولوجيا و إنتاج صناعي	C أبحاث منشورة في الدوريات	D إنسان آلي يخدمنا
43	مجموعة من التقنيات و الأساليب و العمليات المستخدمة في إنتاج السلع أو تقديم الخدمات لإنجاز هدف أو تلبية المتطلبات	A التفكير	B التكنولوجيا	C العلم	D الصناعة
44	يعتبر محكم البحث المعروض للتحكيم في الدوريات العلمية بمثابة	A القاضي	B الناقد العادل	C الحاكم	D الناقض
45	مصطلح Animism يطلق على مبدأ التفكير	A الأسطوري	B الميتافيزيقي	C الخرافي	D الحركي
46	جزء من شخصية العالم العلماء يحتاج إلى مستوى أخلاقي رفيع و انسلخا تاما عن نظرتة القديمة للأمور	A الأمانة	B النقد الذاتي	C الشفافية	D إنكار الذات

 كلية العلوم جامعة أسيوط	الإمتحان النهائي للفصل الدراسي الصيفي للعام الدراسي (2023-2024) تفكير علمي (14 ع)		
كلية العلوم	لطلاب بكالوريوس العلوم التاريخ : 2024/8/27	الوقت المتاح ساعتان	جامعة أسيوط

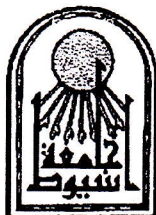
47	دعى	بفصل الفلسفة عن العلم و إمكانية تطبيق العلوم
	A	أرسطو
	B	بيكن
	C	ديكاندول
	D	أفلاطون
48	يتحمس العالم لاعترااف المتخصّصين والعارفين بقيمة عمله من خلال	
	A	إلقاء المحاضرات
	B	جني المال
	C	الشهرة
	D	النشر في الدوريات المرموقة
49	ازدهرت علوم المسلمين في	
	A	العصر الحديث
	B	فجر الإسلام
	C	العصور الوسطى
	D	الحكم العثماني
50	يمكنها إجمال خصائص العالم كالروح النقدية والنزاهة و الحياد	
	A	الموضوعية
	B	الأمانة
	C	التنظيم
	D	الشمولية

31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50

انتهت الأسئلة مع خالص تمنياتي بالنجاح و التوفيق

د. أحمد محمد عبد الرحمن

أستاذ مساعد البيئة النباتية بقسم النبات و الميكروبيولوجي

	Faculty of Science Botany and Microbiology Department Biotechnical Analysis (B453) Course Time: 2 hours Marks: 50 mark Summer semester 2023/2024 Level: Fourth	
---	---	---

The questions are on four pages

Answer the following questions

Frist Question: Choose the correct answer:

(25 marks)

- The is a physical method of separation in which the components to be separated are distributed between two phases.
a) Chromatograph b) Centrifugation c) Chromatogram d) Chromatography
- The is the solvent that will carry the analyte.
a) Eluent b) Eluate c) control d) none of the above
- Efficiency of column chromatography separation, with ratio length / width increases.
a) decreases b) increases c) not change d) all the above
- Preventing buffer contamination by mixed with.....sodium azide.
a) 0.6% b) 0.2% c) 0.02% d) None of the above
- In chromatography, stationary phase is thin film of liquid formed on the surface of a solid inert support.
a) Ion exchange b) Affinity c) Partition d) None of the above
- The is also called electronic spectroscopy.
a) UV spectrometer b) Colorimetry c) Atomic spectrometry d) both a & b
- The Ag (antigen) is incorporated in the agar before pouring it in the plates in
a) Double diffusion test b) Single (radial) diffusion c) Fluorescent immunoassay d) a & c
- Large cells are broken by chopping action through:
a) French press b) Sonication
c) Hand homogenizer d) Blade homogenizer
- In column chromatography, the of column temperature results in speed of elution but does not improve separation.
a) decrease b) increase c) change d) all the above
- The..... buffer suitable for gel permeation and cation-exchange chromatography.
a) Tris b) Phosphate c) Hepes d) Borate

11. In immunofluorescence technique, we tag the fluorescein molecule to.....
 - a) Antibody
 - b) Antigen
 - c) both a&b
 - d) none of the above
12. For separation of subcellular organelles, and isolation of macromolecules we can use:
 - a) Chromatography
 - b) Colorimeter
 - c) Spectrophotometer
 - d) none of the above
13. In rotors, the tubes are held in vertical position during rotation.
 - a) Vertical
 - b) Fixed angle
 - c) Swinging bucket
 - d) both a &c
14. In centrifugation, density of the sample solution must be less than that of the lowest density portion of the gradient.
 - a) Differential
 - b) Isopycnic Density-Gradient
 - c) Rate-zonal
 - d) both a &c
15. In spectrophotometer, the ultraviolet light source is lamp.
 - a) Deuterium
 - b) Tungsten
 - c) Fluorescent
 - d) None of the above
16. The is used in inorganic chemical analysis to analyze the elemental composition of samples.
 - a) Colorimeter
 - b) PH meter
 - c) UV spectrometry
 - d) Flame photometer
17. Blood grouping test is an example to:
 - a) Precipitation test
 - b) Agglutination test
 - c) ELISA
 - d) None of the above
18. Microtiter plate is a plastic plate that contains..... wells.
 - a) 96
 - b) 98
 - c) 94
 - d) 100
19. Thehas been largely replaced in routine clinical laboratory practice by enzyme immunoassay.
 - a) ELISA
 - b) FIA
 - c) RIA
 - d) None of the above
20. In the chromatography, stationary phase is porous gel with no attractive action on solute molecules.
 - a) Molecular Exclusion
 - b) Affinity
 - c) Ion exchange
 - d) partition
21. solution is containing all the substances used in the immunoassay except the antigen to be tested.
 - a) Standard
 - b) Blank
 - c) Control
 - d) Diluent

22. The is a protein produced in the body to a foreign substance.

- a) Antibody b) Antigen c) Control d) both a&b

23. Immunoassays measure:

- a) Antibody b) Antigen c) Control d) both a&b

24. Swinging bucket rotors are most commonly used for:

- a) Pelleting applications b) Isopycnic separation
c) Density gradient d) All of the above

25. In differential and rate-zonal centrifugation, the separation of the particles is according to their:

- a) size b) density c) both a&b d) non of the above

Second Question: Put (√) or (×):

(25 marks)

1. Solvents should be high viscosity & high volatility to increase CC efficiency. ()
2. If the stationary phase is polar, chromatography is reversed phase. ()
3. In flame photometer, filters select which colors the photometer detects and exclude the influence of other ions. ()
4. Colorimeter can be used in UV and visible wavelengths. ()
5. Cell forced through narrow gap leading to disruption of cell membrane by hand homogenizer. ()
6. Good buffer is relatively free side effect buffer. ()
7. Combined PH meter electrodes are better stored immersed in the bridge electrolyte (KCl 3 M). ()
8. In column chromatography, uniform & high flow rate of solvent gives better resolution. ()
9. Tris buffer is suitable at pH 4. ()
10. Preparative chromatography was used to separate the components of a mixture for more advanced use. ()
11. Enzyme immunoassay (EIA) use an enzyme to label either the antibody or antigen. ()
12. Excessive run times have no adverse effect in the isopycnic separation. ()
13. Increase in column temperature results in speed of elution and improve separation. ()
14. Centrifuges tubes are exclusively made of glass. ()

15. Spectrophotometer is useful for determining the concentration of a known substance in solution. ()
16. $RCF = 1.12 \times 10^5 \times (rpm)$. ()
17. Buffer is a solution that does not resist PH change. ()
18. If K_d (distribution coefficients) is large; solute is eluted more strongly by stationary phase. ()
19. The analyte is the substance to be separated during chromatography. ()
20. In sandwich ELISA , a known Ag is fixed to a solid phase. ()
21. Paper chromatography has the advantage that the corrosive reagents like sulphuric acid can be used. ()
22. The HPLC is a form of liquid chromatography that utilizes small size columns and higher mobile phase pressures. ()
23. The GC is a type of chromatography used for separating and analyzing compounds that can be vaporized and decomposed. ()
24. Immunoassays depend on the use of an analytical reagent that is associated with a detectable label. ()
25. In Single beam spectrophotometers, both the blank and the sample cells are placed in the instrument at the same time. ()

The end of the questions,,,,,,,,,,,,,,,,,,,,,

Good luck

Dr/ Huwida Abdel-kader

1961

فلسفة التاريخ



Assiut University
Faculty of Science
Chemistry Department

Final Examination in Petroleum & Petrochemicals (451C) for the 4th Level
(Summer Term)

Date: Wednesday, 04/09/2024

Time: 2 hours

Answer the following questions:

(50 Mark)

Question 1.

- a) Describe the Solvent Extraction methods for Sulphur reaction.
- b) Show by chemical structures the composition of crude petroleum (Sulphur and Nitrogen only).

Question 2.

- a) What you mean by Octane number & Oxygenate additives.
- b) Explain the Carbide Theory for origin of the Petroleum and its defects.

Question 3.

Discuss the following terms:

- a) Steam cracking mechanism of Ethane.
- b) Absorption and Adsorption Processes

Question 4.

- a) Discuss the Catalytic hydrodesulfurization process.
- b) Explain the Knocking phenomena in Gasoline and how the Viscosity Index affected by the type of Hydrocarbon

الامتحان الشفوي : (10 درجات)

1) Starting from the following building blocks, discuss what are the petrochemicals can be produced from it :

- a) Methane
- b) Butadiene

Good Luck
Examiner
Prof. Dr. Kamal Ibrahim Aly



Answer the Following Questions:

Section I

1- Put (✓) or (×) for the following sentences

(5 Marks)

- 1- The rate of physical adsorption is greater than chemical adsorption ()
- 2- The adsorption of gas on solid depend on nature of solid ()
- 3- Isomorphism is a compound with two different crystal forms ()
- 4- The number of charge carriers that can result from ordinary donor or acceptor ionization is $[D] + [A]$ ()
- 5- A catalyst support is stable under reaction and regeneration conditions ()
- 6- The heat of chemisorption is a measure of strength of the bonds formed between adsorbent and adsorbate ()
- 7- The doping of NiO with monovalent metal decreases its electrical conductivity ()
- 8- In impregnation method for synthesis of a catalyst requires more equipment ()
- 9- Structure promoter changes the chemical composition of the catalyst ()
- 10- Selective catalyst should proceed the reaction to products ()

2-) Choose the correct answer

(5 Marks)

1. Selective catalyst should
 - (i) Increase the reaction rate
 - (ii) Change the reaction products
 - (iii) Increase the number of molecules adsorbed on the catalyst surface
 - (iv) Proceed the reaction to desired products.
2. What is not true for desirable characteristic of support
 - (i) Desirable mechanical properties
 - (ii) High surface area
 - (iii) Low cost
 - (iv) Unstable under reaction and regeneration conditions
3. How does a catalyst increase the rate of reaction?
 - (i) By forming an intermediate complex
 - (ii) By lowering activation energy
 - (iii) By increasing activation energy
 - (iv) By changing the equilibrium constant
4. According the chemical approach, the desirable energy for decomposition the intermediate complex is
 - (i) High energy
 - (ii) Low energy
 - (iii) Intermediate energy
 - (iv) None of them

5. When n and P-type semiconductors are allowed to come into contact
- (i) Some electrons will flow from n to P (ii) Some electrons will flow from P to n
 (iii) The impurity element will flow from n to P (iv) The impurity element will flow from P to n
6. A solid having regular shape is
- (i) Semicrystalline (ii) Anisotropic (iii) Amorphous (iv) Crystalline
7. Which of the following is not characteristic of chemisorption
- (i) It is irreversible (ii) It is specific (iii) It is multilayer phenomenon
 (iv) Heat of adsorption is about 100 kJ
8. The thermal conductivity is corresponded to,
- (i) Lattice vibration (ii) Contribution from electrons
 (iii) Small contribution from electrons (iv) All of them
9. Substances that decrease the activity of a catalyst known as
- (i) Promoters (ii) Controllers (iii) Poisons (iv) Inhibitors
10. Which of the following statement is not true?
- (i) The value of adsorption enthalpy of physical adsorption is less than chemical adsorption
 (ii) Physical adsorption occurs due to Van der Waal's forces
 (iii) Chemical adsorption decreases at high temperature and low pressure
 (iv) Physical adsorption is reversible

3-Answer two only from the following

(10 Marks)

- a- Mention the factors affecting thermal conductivity of solids and derive an equation that be used for calculation of specific heat of solids
- b- Explain the precipitation method for manufacture of industrial catalyst and mention the forming operations.
- c- From adsorption isotherm data, apply the BET equation for calculation of specific surface area of a catalyst.

4- Write short notes on three only of the following:

(9 Marks)

- a) The factors are responsible for deactivation of a catalyst.
- b) Synthesis of γ -alumina from bauxite.
- c) The important characteristic properties of catalyst supports.
- d) The factors are influence in the amount of gas adsorbed on solid materials.

5- Define the following terms

(4 Marks)

- (i) Turnover number (ii) Center of symmetry (iii) Schottky defect
 (iv) Non-stoichiometric compound

Good Luck, Prof. Dr. Abd Al -Aziz Ahmed Said

Part 2: Electrochemical section (17 marks)

Q1: Complete the following (5 marks)

- i) The polarization cell consists of three electrodes; , and
- ii) The internationally accepted primary reference electrode is
- iii) The exchange current (I_0) is define as
- iv) Faraday's law: the amount of substance changed during electrochemical reaction is proportional to
- v) Zeta potential is define as
- vi) The magnitude and sign of the zeta potential depends on both and
- vii) The *Galvani potential difference* consists of and
- viii) One limitation of Debye-Huckel law is
- ix) In any circuit there are junction potentials whenever come into contact.
- x) When a charged species of a substance is exposed to an electric field its chemical potential is called

Q2 Answer only three from the following (4 marks for each one):

- 1- What is the time in minute necessary to deposit 5 grams copper by passing current 2.5 A in a cell containing CuSO_4 solution at 25°C , ($F = 96485 \text{ C mol}^{-1}$, $\text{Cu} = 63.54 \text{ g. mol}^{-1}$)?
- 2- Explain the types of polarization (overpotential).
- 3- Drive the equation which indicate "kinetic salt effect" phenomenon.
- 4- If you start form the *Butler-Volmer equation* for a one-electron electrode reaction:

$$I = I_0 \left[e^{\frac{-\beta F \eta}{RT}} - e^{\frac{(1-\beta) F \eta}{RT}} \right]$$

Drive the equation of " linear polarization resistance" and the Tafel's equation.

Assuit University Faculty of Science Chemistry Department		Time: 2 hrs Course Code: C-413
Final Examination of Biochemistry (413 C) For 4 th Year Students (Summer Course)		

Answer the following questions:

(50 Marks)

Q1: Write True (T) or False (F) in front of the following statements.

(26 marks, 2 Mark for each)

- 1- All carbohydrates are polyhydroxy aldehydes or ketones or compounds that hydrolyze to produce them.
- 2- Glucose provides energy for the brain and $\frac{1}{2}$ of energy for muscles and tissues.
- 3- Monosaccharides contain chiral carbon atoms.
- 4- Diastereomers are stereoisomers that are not enantiomers.
- 5- Epimers, two sugars that different only in the configuration around one carbon atom.
- 6- Chiral centers are carbon atoms which have 5 different atoms bonded to it.
- 7- A reducing sugar is a sugar with an aldehyde group that reduces a metallic oxidizing agent.
- 8- A strong oxidizing agent such as HNO_3 can oxidize the aldehyde and the alcohol groups.
- 9- Cellulose is a polymer of glucose that forms plant cell walls.
- 10- Maltose is a disaccharide with an $\alpha(1, 4)$ glycosidic link between (C_1 , C_4) OH of 2 glucoses.
- 11- Reduction of glucose by Tollen's reagent produces glycolic acid.
- 12- Glucose is a non-optically active compound.
- 13- Monosaccharide has 2^{n-1} stereoisomers, where (n) is the No. of chiral center.

Q2: write the difference between:

(4 Marks, 2 Mark for each)

- 1- Enantiomers and epimers in carbohydrates.
- 2- Glucose, fructose, galactose.

Q3: Choose the correct answer.

(20 Marks, 2 Mark for each)

- 1- Lactose is a disaccharide, formed from.....
a) 2 Glucose b) 2 Fructose c) Glucose, Galactose d) All of above
- 2- Reaction of glucose with Fehling solutions produces.....
a) Glyconic acid b) Acetic acid c) formic acid d) Not react
- 3- Fructose is an optically active compound which contains.....chiral carbon atoms.
a) 4 b) 5 c) 6 d) 3
- 4- is a polysaccharide formed from poly glucose monomers.
a) Ammonia b) Lactose c) Starch d) Fructose
- 5- Maltose is a Sugar.
a) Reducing b) Oxidizing c) Basic d) All of above.
- 6- Glucose has isomers.
a) 17 b) 16 c) 12 d) 10
- 7- Monosaccharide can be oxidized by
a) Fehling solutions b) Tollen's reagent c) HNO_3 d) All of above
- 8- Sucrose is a disaccharide produces from binding glucose and fructose monomer by bond.
a) Ionic b) Covalent c) Glycosidic d) Chelating
- 9- Monosaccharides have as a general formula.
a) $\text{C}_n\text{H}_{2n-2}$ b) $\text{C}_n\text{H}_{2n}\text{O}_n$ c) C_nH_{2n} d) $\text{C}_n\text{H}_{2n}\text{N}_2$
- 10- are reducing sugars because they contain an aldehyde group in their open-chain form.
a) Acetic acid b) Aldoses c) Ketoses d) Carbonyl

انتهت الاسئلة بالتوفيق
الممتحن / د. أماني عبدالرحمن عثمان

Assiut University

Faculty of Science

Chemistry Department



Date: 7 September 2024

Time: 3 hours

Marks: 50

Analytical Chemistry Examination (C-441)

Answer the following questions: (50 Marks)

1-Define only two of the following terms: (5 Marks)

Total chlorine, Isoelectric point, Dialysis, gel permeation chromatography

2- Discuss briefly only three of the following: (15 Marks)

- 1) Components of HPLC system.
- 2) General requirements of HPLC column packing materials.
- 3) General criteria in selecting the sampling points.
- 4) BOD and COD
- 5) Protein separation via ion-exchange chromatography
- 6) Protein separation/purification via electrophoresis

3- Complete the following sentences: (5 Marks)

- 1) The most important tests used in water-quality surveillance are,,, and
- 2) Aesthetic parameters are those detectable by the senses, namely:,,, and
- 3) The most common methods for protein purification are,,, and
- 4) Proteins can be selectively precipitated or solubilized by changing,, or
- 5) The membrane processes differ mainly in the of the membranes and the Used.

4- Put (✓) or (X) for the following sentences, and correct the wrong answer: (25 Marks)

- 1) Time between sample collection and analysis should not exceed 12 hours and if ice is not available, the transportation must not exceed 2 hours.
- 2) For good analysis, it is imperative that samples are kept in the light and the cooling is rapid.
- 3) When water that contains chlorine is sampled, the chlorine must be inactivated using sodium sulfate.
- 4) On-site water testing using portable equipment is appropriate in remote areas.
- 5) Precipitation techniques are the most used during the early stage of protein purification sequence.
- 6) Low concentration of neutral salts usually increases the solubility of proteins; however, proteins are precipitated from solution as ionic strength is increased.

- 7) Proteins aggregate and precipitate higher than their pIs because there is no electrostatic repulsion between molecules.
- 8) When the pH of a solution is adjusted to the pI of a protein, the protein precipitates while proteins with different pIs remain in solution.
- 9) Protein solubility at fixed pH and ionic strength is a function of the viscosity of a solution.
- 10) The addition of water-immiscible organic solvents decreases the dielectric constant of an aqueous solution and decrease the solubility of most proteins.
- 11) Organic solvents decrease the ionization of the charged amino acids, resulting in protein aggregation and precipitation.
- 12) The optimum quantity of organic solvent to precipitate a protein varies from 15 to 60%.
- 13) Ion-exchange chromatography and affinity chromatography are two types of adsorption chromatography.
- 14) Dialysis is complicated; however, it is relatively slow method, usually requiring at least 12h.
- 15) The protein solution inside the dialysis bag is often diluted during dialysis, due to the osmotic strength differences between the solution and dialysis buffer.
- 16) Membrane processes such as microfiltration and reverse osmosis are not similar to dialysis but are much faster and are applicable to large-scale separations.
- 17) Reverse osmosis is used to remove aqueous salts, metal ions, simple sugars and other compounds with molecular mass below 5000.
- 18) Dialysis and size-exclusion chromatography are primarily used in the analytical laboratory in a protein separation sequence.
- 19) Dialysis is performed after $(\text{NH}_4)_2\text{SO}_4$ precipitation of a protein to remove excess salt and other small molecules and to solubilize protein in a new buffer.
- 20) Size exclusion chromatography is used to remove salts, change buffers, fractionate proteins, and estimate protein molecular mass.
- 21) Proteins are positively or negatively charged, depending on solution pH and their pI.
- 22) A protein is negatively charged if the solution pH is $<$ its pI, whereas a protein is positively charged if solution pH is $>$ its pI.
- 23) The magnitude of the charge and the applied voltage will determine how far a protein will migrate in an electrical field.
- 24) The lower the voltage and stronger the charge on the protein, the greater the migration within the electrical field.
- 25) Molecular size and shape, which determine the Stokes radius of a protein, also determine migration distance within the gel matrix.

With my best wishes
(Dr. Haitham M. El-Bery)

فوق الفجر

الاختبار النهائي للفصل الدراسي الصيفي العام الجامعي: 2023 م / 2024 م الفرقة: الرابعة - قسم الفيزياء - كلية العلوم درجة الاختبار: 50 درجة الزمن: 120 دقيقة (ساعتين) أستاذ المقرر: د. أيمن شحاته محمد		جمهورية مصر العربية وزارة التعليم العالي - جامعة اسيوط كلية العلوم - قسم الرياضيات اسم المقرر: تحليل رياضي رقم المقرر: MATH 419 التاريخ 2024/9/5

مستعينا بالله أجب عن خمسة أسئلة فقط من الأسئلة الآتية:

السؤال الأول: (10 درجات-4+3+3)

(1) أثبت أن $\sqrt{3}$ عدد غير قياسي.

(2) أحسب النهايات التالية (i) $\lim_{x \rightarrow 0} \frac{(1+x)^5 - 1}{\sqrt{1+x} - 1}$ (ii) $\lim_{x \rightarrow 0} \frac{1 - \cos(x)}{x \sin(x)}$

(3) إذا كانت $S = \{ \frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \dots \}$ أوجد $\min S, \max S, \inf S, \sup S$.

السؤال الثاني: (10 درجات-4+3+3)

(1) أثبت أن المتتابة التي حدها النوني: $x_n = \frac{(-1)^n + 2}{n}$ تقاربية إلى الصفر.

(2) أثبت أن الدالة $f(x) = \sqrt{2+x}$; $x \geq -2$ تزايدية.

(3) احسب قيم التكاملات التالية (i) $\int_{|z|=1} \frac{e^{2z}}{z^3} dz$ (ii) $\oint_{|z|=1} e^z dz$ (iii) $\int_{|z|=2} \frac{1}{(z+1)^3} dz$

السؤال الثالث: (10 درجات-4+3+3)

(1) عين قيمة a بحيث تكون الدالة: $f(x) = \begin{cases} \frac{x^4 - 1}{x - 1}, & x \neq 1 \\ a, & x = 1 \end{cases}$ متصلة عند $x = 1$.

(2) باستخدام تعريف مشتقة، أوجد المشتقة الأولى للدالة $f(x) = \sqrt{x}$.

(3) أثبت أن الدالة $f(x) = x^2$ منتظمة الاتصال في المنطقة $|x| < 1$.

السؤال الرابع: (10 درجات-4+3+3)

(1) ادرس قابلية الدالة للتفاضل $f(z) = \operatorname{Re}(z)$ عند أي نقطة في المستوي المركب.

(2) برهن أن الدالة $u = e^{-y} \cos x$ توافقية.

(3) اكتب بدون برهان شرطاً ضرورياً وكافياً كي تكون الدالة تحليلية ثم استخدمه في إثبات أن $f(z) = e^z$ دالة تحليلية.

السؤال الخامس: (10 درجات- لكل فترة 2 درجة)

ضع علامة صح (✓) أمام العبارة الصحيحة وعلامة خطأ (X) أمام العبارة الخاطئة: (5 درجات)

1. إذا كان z_1, z_2 عددان مركبان هل التعبير التالي صحيح في حقل الأعداد المركبة $|z_1| < |z_2|$ (.....)

2. هل العلاقة التالية $n \log z = \log z^n$ صحيحة بصفة مطلقة (.....)

(1)



نظر خلف هذه الورقة

3. هل العلاقات الآتية محققة في التحليل المركب $|\sin z|$ or $|\cos z| \leq 1, \forall z$ (.....)
4. يتساوى العددين المركبان إذا وإذا فقط تساوت كل من مركبتهما كل على حدة. (.....)
5. إذا كان z_1, z_2 عددين مركبان هل التعبير التالي صحيح في حقل الأعداد المركبة $z_1 < z_2$. (.....)

السؤال السادس: (10 درجات - لكل فترة 2 درجة)

اختر الإجابة الصحيحة من بين الإجابات الآتية ثم انقلها إلى كراسة الإجابة: (10 درجات)

- (1) قيمة المقدار i^{18} تساوي (i) i (ii) $-i$ (iii) 1 (v) -1
- (2) إذا كانت $z = 2 - 3i$ فإن مرافق العدد $\bar{z}$ هو (i) $2 - 3i$ (ii) $3 - 2i$ (iii) $2 + 3i$ (iv) $-2 + 3i$
- (3) إذا كانت $z = 3 + 4i$ فإن القيمة المطلقة للعدد المركب $|z|$ هي (i) 4 (ii) 3 (iii) 5 (iv) $3 - 4i$
- (4) إذا كانت $z = -2$ فإن الصورة القطبية هي (i) $2i$ (ii) $2 \operatorname{cis}(\pi)$ (iii) $2 \operatorname{cis}\left(\frac{3}{2}\pi\right)$ (iv) 2
- (5) إذا كانت $z = e^{i\theta}$ حيث θ السعة للعدد المركب فإن القيمة المطلقة $|z|$ هي (i) 1 (ii) -1 (iii) i (iv) $-i$

انتهت الأسئلة مع أطيب التمنيات بالتوفيق والنجاح د. أيمن شحاته محمد



Final Exam. (Physics Of Low Temperature)

Summer Semester 2023/2024

Time Exam: 3 h

Date: 31/08/2024

Level: 4th (Physics) Code: P422

Total Marks: 50 Mark

Prof. Dr. Essam F. Abo Zeid

"يتم طمس (تسويد) الإجابة المختارة من قبل الطالب باستخدام القلم الجاف فقط"

First part (I): (25 Marks)

Q1: Chose the correct answer from A, b or C?

(1 marks for each)

- 1- Meissner effect occurs when the material becomes.....
A. Paramagnetic B. Superconductor C. Diamagnetic
- 2- The critical magnetic field is the field required for.....
A. Quenching B. Improving C. zero-resistance
superconductivity magnetization
- 3- The order parameter of superconductor is controlled by the number of.....
A. Both of them B. Free electrons C. Cooper pair
- 4- The upper critical field H_{c2} can be calculated in terms of
A. Order parameter B. Coherence length C. London depth
- 5- The lower critical field H_{c1} can be calculated in terms of;
A. Coherence length B. Order parameter C. London depth
- 6- The sign of TEP for a superconductor is usually,
A. Positive B. Negative C. Neither negative nor positive
- 7- The thermal conductivity of electrons in superconductors K_e can be neglected due to.....
A. Zero resistance B. Zero resistivity C. Both of them
- 8- Electron pairs formation occurs as a result of;
A. Electron-electron inter. B. Absorption of phonon C. Both of them
- 9- According to London equation, the field at λ equal
A. $B(a)$ B. $(1/e) B(a)$ C. Zero
- 10- If $\lambda(0) = 5.1 \mu\text{m}$, then H_{c1} equals.....
A. $1.207 \times 10^{-5} \text{ T}$ B. $1.246 \times 10^{-5} \text{ T}$ C. $1.267 \times 10^{-5} \text{ T}$

- 11- If $v_f = 10^6$ m/s, $E_B = 10^{-2}$ eV, then BCS cooper size equal.....
 A. 638.4 Å B. 634.4 Å C. 629.4 Å
- 12- The crystal structure of SmFeAsO system is.....
 A. Orthorhombic B. Tetragonal C. Hexagonal
- 13- The value of flux quantum in SS as compared to NS is;
 A. Twice its value B. Half its value C. Similar value
- 14- The highest value of H_{c2} obtained for high T_c superconductors is about;
 A. 100 T B. 92 T C. 120 T
- 15- The activation energy E_a of flux bundles can be obtained by plot the relation between;
 A. $\ln f$ and T_p B. f and $1/T_p$ C. $\ln f$ and $1/T_p$
- 16- A rapid change of C_{en} at T_c is ascribed to.....
 A. Energy gap B. Electron pairs C. Both of them
- 17- The value of specific heat of a superconductor at T_c is.....
 A. Zero B. $C_{es} \approx 3C_{en}$ C. $C_{es} < 3C_{en}$
- 18- Thermodynamic critical field with decreasing temperature and the variation of the field with temperature given by a parabolic relation.
 A. Increases B. Decreases C. Remains constant
- 19- Onset of diamagnetism occurs when.....
 A. χ' is zero B. χ'' is maximum C. χ' is maximum
- 20- The power (TEP) is a useful tool to indicate the sign of the charge in the superconducting state.
 A. Optoelectrical B. Magnetoelectric C. Thermoelectric
- 21- The is the maximum current that the superconductor can sustain before the voltage develops as a result of resistance.
 A. Eddy current B. Critical current C. Surface current
- 22- In the normal state, the are decay as a result of electrical resistance of a normal metal, and consequently the field could penetrate the normal metal.
 A. Surface currents B. Eddy currents C. Volume currents
- 23- The electronic in the superconducting state (C_{es}) is smaller than in the normal state (C_{en}) at low enough temperatures.
 A. Heat capacity B. latent heat C. Specific heat
- 24- is a measure of the length where the coherent state between the two electrons takes place.
 A. Coherence length B. Coherence distance C. Coherence volume
- 25- In superconductor the current is called or permanent current due to the fact that the resistance is zero at a critical temperature T_c .
 A. Persistent B. Insistent C. Resistant

Second part (II):(25 Marks)

Q2: Write True or False in the following sentences.

(10 Marks- 0.5 mark for each)

1. In normal metals, the electrons are producing a resistance. []
2. H_{c1} is the lower critical field of type (I) superconductor. []
3. Condensation energy is the energy required to break the Cooper pairs. []
4. The Cooper pairs carriers move as a super-current with highly dissipation. []
5. The formula of BCS energy gap invalid when T_c goes above 40 K. []
6. In superconductors, the energy gap is caused by electron-lattice interaction. []
7. A superconductor is a perfect conductor. []
8. In an insulator, the energy gap is caused by the electron-electron interaction. []
9. The current of normal metal generates a voltage and causes dissipation. []
10. The superconducting train is made to enhance the friction between the train and its tracks. []
11. According to Meissner effect, $M = -H$ and $\chi = -1$. []
12. These persistent currents prevent the penetration of the magnetic field inside the superconductor. []
13. The jump of specific heat at T_c is due enhancing the order parameter. []
14. If a current is set up in a superconductor it will flow forever without any driving voltage. []
15. Superconductivity is the phenomenon of sudden disappearance of the material electrical resistance when they are cooled below a characteristic temperature called critical temperature T_c . []
16. Superconductivity is used as sensors in radar apparatus to increase the noise of external electromagnetic field far than radar pulse. []
17. - Field cooling can be done by applying field ($H < H_c$) on a superconductor, and then cooling it to T_c . []
18. London equation can be written as: $\vec{B}_x = \vec{B}_a \exp\left(\frac{-x}{\lambda}\right)$. []
19. The breaking of pairs requires energy less than the binding energy of them. []
20. The entropy of electrons in the NS is higher than SS. []

Q3: Postulate the basic concepts of BCS theory?

(5 marks)

.....

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the paper.

End Of Exam

With all my best regards

Prof. Dr. Essam F. Abo Zeid

Q4. Discuss the screening effect of superconductors?

(5 marks)

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting or typing. There are no margins, text, or other markings on the page.

Q1. Fill in the blanks of the following (30 grades)

1. Intensity of transition is measured by of transition dipole moment.
2. The large oscillator strength indicates of the transition.
3. For both Lambert's law and Beer's law, light is used.
4. From Lambert- Beer's law, the absorbance is proportional to the concentration of the absorbing medium.
5. Mathematically, Heisenberg's uncertainty principle is
6. The natural line width refers to of lines or peaks in the spectra.
7. The selection rule for pure rotational transition is
8. The spectroscopy deals with the interactions of with
9. One of features of quantum mechanics is of angular momentum and energy.
10. A nelectromagnetic radiation possess velocity equals velocity of
11. All electromagnetic radiations possess both nature and nature.
12. Each wave is associated with a particular,, and
13. The arrangement of electromagnetic radiations in order of their frequencies or wavelength is known as
14. In the electromagnetic spectrum, the cosmic rays possess frequency and radio waves possess frequency.
15. Only those transitions between energy level takes place that have different
16. For p^2 -configuration, the number of microstates is
17. The value of and specify each permissible micros
18. The selection rule for orbital angular momentum (l) involved in transition between different energy level is
19. The transition from atomic state $2S^{1/2}$ to $P^{3/2}$ are allowed by considering selection rule and
20. LS coupling scheme is used to determine term symbols for those atoms having atomic number
21. diagram shows the transition between atomic states along with energies.
22. In the spectra of hydrogen atom, the transition of electrons takes place from $2S^{1/2}$ to and
23. Splitting of spectral lines in presence of magnetic field is known as effect.

24. Splitting of spectral lines in presence of applied field is known aseffect.
25. In photoelectron spectroscopy, we discuss about and
26. The value of magnetic quantum number for a given value of principle quantum number is
27. The value of spin quantum number for an electron may be and
28. The value of azimuthal quantum number for p-orbital is
29. Atomic state corresponding to zero of total orbital angular momentum is
30. There are atomic states for an atom having p^2 configuration.

Answer the following questions : [each of 5 grades]

1. What is the effect of isotopic substitution on rotational spectra

2. Discuss the rotational spectrum of non-rigid rotator

3. What are P, Q and R branches of the vibration-rotation spectrum

4. Discuss effect of nuclear spin in vibrational spectroscopy

***** The End *** Good Luck *** Prof. Galal S. Hassan *****



Final Exam. (Selected Topics in Physics 2)

Summer Semester 2023/2024

Time Exam: 3 h

Date: 25/08/2024

Course Code: (P492)

Total Marks: 50 Marks

level: 4th level

Course Corresponder: Prof. Dr. Essam F. Abo Zeid

"يتم طمس (تسويد) الإجابة المختارة من قبل الطالب باستخدام القلم الجاف فقط"

First part (I): (25 Marks)

nQ1: Choose the correct answer A, B, or C:

(1 Mark each)

1. The electrolyte in AFCs is a concentrated Solution.
A. Nafion. B. KOH. C. H_3PO_4
2. The mobile ions in the AFC system are theions in the alkaline solution that are transported from the cathode..
A. H^+ B. CO_3 C. OH^-
3. is the most mature fuel cell technology in terms of system development and commercialization activities.
A. PEMFC. B. PAFC. C. AFC.
4. In contrast to the AFC,are tolerant of CO_2 because concentrated phosphoric acid (H_3PO_4) is used as the electrolyte.
A. MCFC. B. PAFC. C. PEMFC.
5. have demonstrated excellent thermal, chemical, and electrochemical stability compared to other fuel cell systems.
A. SOFC. B. PEMFC. C. PAFC.
6.is the cell uses one of the simplest reactions of any fuel cell.
A. MCFC. B. PAFC. C. PEMFC.
7. To get a voltage up to a reasonable level, many separate fuel cells must be combined to form a fuel-cell.....
A. Stuck. B. Stack. C. Contact.
8. PEMFCs operate at a fairly low temperature (about.....).
A. $\sim 100^\circ C$. B. $\sim 60^\circ C$. C. $\sim 80^\circ C$.
9. The have received considerable attention lately as the primary power source in electric vehicles for several reasons.
A. SOFCs B. PEMFCs C. PAFCs
10. The uses the same basic cell construction as for the PEMFC.
A. DMFC. B. MCFC. C. PAFC.
11. The use CH_3OH as the fuel and O_2 as the oxidant.
A. SOFCs. B. PEMFCs. C. DMFCs.

Second Part (II) (25 Marks)

Q2: Answer all the following questions

(5 Mark each)

- I. Draw the scheme which indicates direct energy conversion with fuel cells in comparison to conventional indirect technology.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

- II. Write on the Attractive characteristics of Fuel Cell.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

12. The lower cell performance of a DMFC is caused by the poor kinetics of thereaction.
 A. Cathode. B. Anode. C. Electrolyte.
13. At present, the most active anode catalysts are based onalloys.
 A. Pt-Ru B. Pt-Li. C. Pt-Ra.
14. A molten carbonate salt mixture is used as electrolyte.
 A. DMFC B. PAFC C. MCFC
15. MCFCs typically operate at temperatures between..... providing the opportunity for high overall system operating efficiencies.
 A. 600-700 °C B. 800-900 °C C. 500-600 °C
16. The SOFC systems operate between, higher than any other fuel cell system.
 A. 600-700 °C. B. 800-900 °C. C. 900-1000 °C.
17. Developments in SOFC systems that operate at intermediate temperatures are currently receiving considerable attention.
 A. (550-800 °C) B. (650-800 °C) C. (450-800 °C)
18. One of the drawbacks of DMFC is that the low-temperature oxidation of methanol to hydrogen ions and carbon dioxide requires a more active
 A. Material B. Cathode C. Catalyst
19. Theis the ion that pass through the electrolyte, for several types of fuel cell is a hydrogen ion H^+ .
 A. Membrane B. Charge carrier C. Current
20. A.....is a device that converts the chemical energy of a fuel cell and an oxidant into electricity.
 A. Fuel cell B. Membrane C. Reformer
21. The Fuel cell construction generally consists of a fuel electrode (anode) and an oxidant electrode (cathode) separated by an ion-conducting
 A. Membrane B. Material. C. Electrode
22. The PEM fuel cells used a solid polymer membrane as electrolyte, this polymer is permeable to But it does not conduct electrons.
 A. Deuterons. B. Neutron. C. Protons.
23. The are believed to be the best type of fuel cell as the vehicular power source.
 A. DMFC. B. SOFC. C. PEMFC.
24. The total electrical power of fuel cell= voltage (volts) x
 A. Energy (Joule). B. Current (Amps) C. Capacitance (Farad).
25. The charge carrier for an AFC is the that migrate from cathode to anode.
 A. hydroxyl ion (OH-). B. hydrogen ion H^+ . C. Anion.

[illegible][illegible]

This image shows a full page of a document template designed for handwritten notes or essays. It features approximately 28 evenly spaced horizontal dotted lines across the entire width of the page, providing a guide for letter height and placement. The background is plain white, and there are no margins, headers, or footers visible.

With all my best wishes to you for success

Page 5/5

إِسْمَاعِيلُ



2023/2024 Summer Semester, Final Examination

2 September 2024

On: Statistical Methods in Geophysics (G-456)

Time: 2 hours

Answer the following questions:

First Question: Solve ONLY THREE of the following problems:

(9 marks)

1. Given the dataset of earthquake magnitudes: [4.2, 5.1, 3.8, 4.9, 5.3, 4.7], calculate the mean, median, and mode.
2. Calculate the variance for the dataset: [4, 7, 5, 9, 6]. (Assume it's a sample, not a population.)
3. Calculate the interquartile range (IQR) for the dataset: [3, 7, 8, 5, 12, 10, 6, 9].
4. Calculate the quartiles for the following dataset: [2, 4, 7, 8, 10, 12, 15, 18].

Second Question: True or False:

(15 marks)

1. The range is a more robust measure of dispersion compared to the standard deviation because it is not affected by outliers.
2. A skewness value of 0 indicates a perfectly symmetrical distribution.
3. The 75th percentile is also known as the third quartile (Q3) in a dataset.
4. A correlation coefficient of 1 indicates no relationship between the variables.
5. Interpolation can only be used to estimate values within the range of known data points.
6. A kurtosis value of 3 is indicative of a distribution with lighter tails than the normal distribution.
7. Extrapolation is generally more reliable than interpolation because it uses more data points.
8. In the stratified random sample, elements of the population are divided into groups representing similar types, then the simple random sample is taken within each stratum to select some items and combine the results to get the sample.
9. A small variance indicates that numbers in the data set are far from the mean and each other, however, a large variance indicates the opposite.
10. Cross-section data is data collected on different elements at the same point in time or for the same time, such as the information collected from a 2D resistivity survey.
11. Left skewness indicates a distribution with an asymmetric tail extending toward more positive values.
12. Variance is the average of the squares of the deviations of the observations from their mean.
13. Datasets with low kurtosis tend to have heavy tails (leptokurtic), while datasets with high kurtosis tend to have light tails (platykurtic).
14. The interquartile range is the spread between the first and the second quartiles. It gives an estimate of the range of the middle 25% of the population.
15. Kriging is a multistep process. It includes exploratory statistical analysis of the data, variogram modeling, creating the surface, and exploring a variance surface.

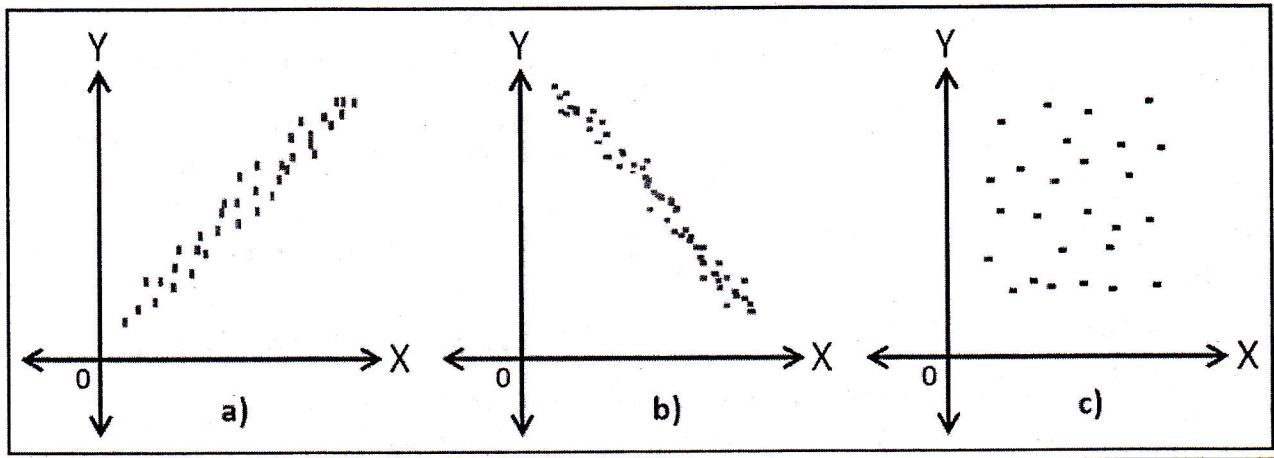
Third Question: Choose the correct answer:

(15 marks)

1. A/An _____ is an observation that appears to be inconsistent with the remainder of that set of data.
A) Outlier B) Missing data C) Logical data D) Simple random sample
2. What information does a histogram provide about a dataset?
A) The exact values of the data points B) The frequency distribution of the data
C) The median and mode of the data D) The cumulative frequency of the data
3. What does a cumulative frequency curve show?
A) The number of data points within each bin of a histogram
B) The average value of the data
C) The total frequency of data points up to a certain value
D) The shape of the data distribution
4. Which of the following statements is true about the mode of a dataset?
A) It is the average of all values. B) It is the middle value of the ordered dataset.
C) It is the value that appears most frequently. D) It is the value with the highest numerical value.
5. What does the Pearson correlation coefficient measure?
A) The degree to which two variables move together linearly
B) The mean of two datasets
C) The spread of the data points around the mean
D) The difference between the highest and lowest values
6. What does kurtosis measure in a dataset?
A) The tails' heaviness and the peak of the distribution B) The average value of the data
C) The spread of the data around the mean D) The frequency of the data points
7. Which statement best describes the difference between correlation and regression?
A) Correlation measures the strength of a linear relationship, while regression estimates the relationship between variables and makes predictions.
B) Correlation estimates the relationship between variables, while regression measures the strength of a linear relationship.
C) Correlation and regression are the same and provide identical results.
D) Regression is only used for categorical data, while correlation is used for continuous data.
8. Data collected on the same element for the same variable for different periods, such as water levels at a certain area during the period from 2000 to 2020, is _____.
A) Qualitative data B) Cross-section data
C) Simple random sample D) Time series data

7. In statistics, this term refers to a method of data collection where only a subset of a population is analyzed, often used in geophysical surveys to infer properties of larger areas.
8. This process involves estimating values beyond the range of known data points, often used in predicting future geophysical trends.

Fifth Question: Based on the three scatter plots (a, b, and c) provided below, identify the type of correlation that might be present between the variables X and Y. (3 marks)



All the best,,,

Assoc. Prof. Rashad Sawires

Assiut University
Faculty of Science
Department of Geology



Date: August 2024
Time allowed: 2 hours

Final Exam

Geothermal and Radiometric Methods (G 452), Total 50 Marks

A) Mark the following statements with True (✓) or False (X): (25 marks, one mark each)

No	Statement	TRUE (✓)	FALSE (X)
1	In radiometric survey, the most significant isotopes are uranium, thorium, and potassium		
2	Radioactivity is the process where a stable atom becomes unstable through the process of decay or breakdown of its nucleus		
3	Radiometric can be used as a mapping tool for certain rock types change		
4	The radioactive decay processes can be affected by the chemical and physical processes in the surroundings		
5	The time it takes for one third of the material to decay or disintegrate is called the half-life time		
6	The radioactive decay of uranium and thorium elements leads to unstable isotopes of lead		
7	The radioactivity in sedimentary rocks is lower than the igneous rocks		
8	Studying the radioactivity of rocks and minerals can provide useful information about the heat production with the earth		
9	One of the assumptions made in radiometric dating is that no loss or gain of parent or daughter		
10	The disadvantage of Potassium-Argon age dating is the vulnerability of Argon gas to be lost by alteration or heating		
11	Zircon (accessory mineral) is the most commonly mineral used for U-Th-Pb age dating		
12	The ^{14}C method has mainly been used for dating plant material in addition to glacier ice		
13	The $^{18}\text{O}/^{16}\text{O}$ ratio provides a record of ancient water temperature		
14	Geiger-Muller counter can be used for land and airborne radiometric survey		
15	The Gamma Ray Spectrometer can be calibrated by flying over an area of known radioisotope concentration		
16	Radon Emanometer cannot be used to map faults		
17	Heat escaping through the earth sets off various geological processes		

18	The leftover heat from the accretion of the earth represent 70% of the source of heat energy within the earth		
19	Heat transfer from the earth's interior to the surface by radiation		
20	Thermal conductivity controlled by the porosity and minerals present in a rock		
21	The greater the depth the greatest the thermal gradient and the lowest the thermal conductivity		
22	The mean heat-flow values of continents and oceans are nearly equal		
23	Oceanic ridge is one of the regions of anomalous heat flow		
24	The seepage of thermal water pockets through fissure and cracks can create local temperature disturbance		
25	In borehole lithology, the greatest temperature gradient occurs in shales and the lowest in salt		

B) Choose the correct answer of the following: - (25 marks, one mark each)

26) The process that takes place when an electron from the innermost (K) shell enters the nucleus is called:

- a) K shift
- b) K release
- c) K capture
- d) K detection

27) In radiometric survey the Gamma ray is detecting by:

- a) resistivity meter
- b) voltmeter
- c) spectrometer
- d) nanometre

28) Which of the following is the measure of the activity of radioactive specimen:

- a) Roentgen
- b) Curie
- c) Total counts
- d) all the above

29) Radioactive decay processes can be affected by:

- a) Physical processes of the surroundings
- b) Chemical processes of the surroundings
- c) Physical and Chemical processes of the surroundings
- d) none of the above

30) Isotopes are the basis of radiometric dating of rocks because:

- a) the known decay constant of isotopes
- b) they are unaffected by physical and chemical processes
- c) a and b
- d) none of the above

31) One of the assumptions made in radiometric dating is:

- a) no loss or gain of parent or daughter
- b) unknown decay constant
- c) unknown half-life time
- d) all the above

32) Accurate age dating method must fulfil the following:

- a) a decay only one-way
- b) no other source of daughter
- c) both daughter and parent stay in place
- d) all the above

33) The most age dating methods are:

- a) Potassium-Aragon
- b) Uranium-Lead
- c) Rubidium- Strontium
- d) all the above

34) The advantage of Rubidium-Strontium age data is that the system is:

- a) Gas-Gas
- b) Solid-Gas
- c) Solid-Solid
- d) none of the above

35) The tritium age dating method can be used to determine:

- a) age of the Earth
- b) age of planet
- c) age and recharge of groundwater
- d) age of glacier ice

36) The disadvantage of ^{87}Rb - ^{87}Sr age dating method is:

- a) Rb is not abundant element in the crust
- b) cannot apply to young rocks due to long half-life
- c) the initial presence of non-radiogenic Sr in most minerals
- d) all of the above

37) The ancient climatic features are derived from analyses of:

- a) Tritium isotopes
- b) Uranium isotopes
- c) Oxygen isotopes
- d) Carbon isotopes

38) Which of the following instruments can be used in radiometric survey:

- a) Geiger-Muller Counter
- b) Scintillation Meter
- c) Gamma-ray Spectrometer
- d) all of the above

39) The presence of radon at the surface indicate buried:

- a) Uranium concentrations
- b) Carbon concentrations
- c) Potassium concentrations
- d) Rubidium concentrations

40) Thermal measurements have provided regional and local information on:

- a) theory of convection on the mantle
- b) position of structures such as salt domes
- c) stratigraphic correlation from borehole measurements
- d) all of the above

41) The percentage of heat produced within the earth by radioactive decay of long-lived isotopes is:

- a) 10%
- b) 30%
- c) 50%
- d) 70%

- 42) Heat is transferred from the earth's interior to the surface by:**
- a) conduction
 - b) diffusion
 - c) simulation
 - d) none of the above
- 43) The measure of how easily heat flows through material is known as:**
- a) heat flow
 - b) thermal gradient
 - c) thermal conductivity
 - d) thermal energy
- 44) The rate of change in temperature with depth is known as:**
- a) heat flow
 - b) thermal gradient
 - c) thermal conductivity
 - d) thermal energy
- 45) The greater the depth will result in:**
- a) greatest thermal gradient and lowest thermal conductivity
 - b) lowest thermal gradient and greatest thermal conductivity
 - c) lowest thermal gradient and lowest thermal conductivity
 - d) greatest thermal gradient and greatest thermal conductivity
- 46) At non-volcanic areas, the boreholes and mines measurements showed that the temperature increases with depth:**
- a) 10°C per 100m
 - b) 5°C per 100m
 - c) 3°C per 100m
 - d) 2°C per 100m
- 47) On the thermal gradient measurements, the measured temperature could be affected by:**
- a) topography
 - b) climate variations
 - c) sedimentations
 - d) all of the above
- 48) The equality of continental and oceanic heat flow is due to:**
- a) oceanic mantle has higher concentration of radioactive minerals
 - b) continental mantle has higher concentration of radioactive minerals
 - c) oceanic crust has higher concentration of radioactive minerals
 - d) continental crust has lower concentration of radioactive minerals
- 49) Thermal measurements can be used for the prospection of:**
- a) thermal reservoir
 - b) salt domes
 - c) groundwater
 - d) all the above
- 50) Regions of anomalous heat flow may result from:**
- a) high concentrations of radioactive minerals
 - b) high electrical conductivity
 - c) increase in iron mineral content
 - d) High percentage of organic matter

=====End of Questions=====



2023/2024 Summer Semester, Final Examination

1 September 2024	On: Petrophysics and Well Logging (G-459)	Time: 2 hours
------------------	--	---------------

Answer ONLY the required questions, illustrating your answer by suitable SKETCHES wherever possible:

First Question: Write short notes on ONLY FOUR of the following: (16 marks)

1. Types of drilling rigs
2. Basic components of a rotary drilling rig
3. Types and functions of drilling fluids
4. Zones of invasion and resistivity profiles
5. Discrimination between washout and breakout from Caliper log
6. Horner plot and Bottom-Hole Temperature (BHT) correction

Second Question: For ONLY FIVE of the following, demonstrate their estimation using equations based on the accompanying well logs: (15 marks)

1. Shale volume (SP and gamma-ray logs)
2. Formation water resistivity (SP log)
3. Total porosity (Bulk density and sonic logs)
4. Mud-cake thickness (Caliper log)
5. Porosity of gas-bearing formation (density and neutron logs)
6. Geothermal gradient and formation temperature (temperature log)
7. Formation resistivity factor and water saturation (Electrical logs)

Third Question: True (T) or False (F): (6 marks)

1. An unexpected entry of formation fluids into the wellbore, causing a rise of mud-level in the mud pit is called a kick.
2. The porosity of the flushed zone is larger than that of the uninvaded zone.
3. Positive SP is developed against reservoir section when salinity of formation water is more than that of mud filtrate.
4. The gamma-ray, density and neutron logs are nuclear measurements.
5. Generally, with resistivity tools the greater the spacing between the measuring electrodes the greater the depth of investigation.
6. Drill collar is the heavy square or hexagonal steel member suspended from the swivel through the rotary table.

Fourth Question: Match the type of well casing with its primary function: (3 marks)

Well Casing Type	Primary Function
A. Conductor casing	1. Protects the formation and isolates zones
B. Surface casing	2. Provides structural integrity in the wellbore
C. Production casing	3. Secures the wellbore through the surface zone

Answer (T) for true sentences or (F) for false sentences: (One mark each.)

1. Non-metallic minerals are those from which metals such as Cu, Au, Fe, and Zn can be recovered by smelting.
2. Metallic minerals are used for their physical or chemical properties rather than for the chemical elements they contain.
3. Mineralogy often changes within an ore body and, hence, during the life of a mine.
4. The first people to mine and use coal were the Egyptians, about 4000 years ago.
5. Occurrences of usable minerals are limited in abundance and located in specific places within the Earth's crust.
6. Ore minerals are aggregates of minerals from which one or more minerals can be extracted profitably.
7. Chromite, magnetite, and PGE are formed during the late magmatic stage.
8. The most important magmatic deposits are restricted to mafic and ultramafic rocks.
9. Chalcopyrite and bornite are primary minerals.
10. Covellite and chalcocite are primary minerals.
11. Tin and tungsten deposits are commonly associated with felsic rocks.
12. Common examples of deposits formed during the early magmatic stage are gold and silver minerals.
13. Secondary enrichment helps the low-grade deposit become high-grade.
14. Concentration by hot, aqueous solutions flowing through fractures and pore spaces in crustal rock to form hydrothermal deposits.
15. Pegmatite is crystallized from volatile, rich fluids, represented by very coarse-grained crystals (e.g., feldspar), and enriched in gemstones and rare earth elements (REE).
16. The ore within the weathered cap of sulphide deposits is called 'gossan'.
17. Ore grades are appreciably changed by metamorphism.
18. Mineral paragenesis and intergrowth are important bases for subsequent mineral processing.
19. Mineralogy has a big influence on the mining technique chosen and the sequencing of mining operations.
20. For gold mining, gossan is mined because it is more easily accessible, naturally enriched, and easier to recover.
21. Mineral deposits are any volume of rock containing an enrichment of one or more minerals.
22. Sphalerite, galena, and chalcopyrite are ore minerals from which copper, zinc, and lead, respectively, can be extracted.

23. "Mineral deposit" is an economic term, whereas "ores" is a geologic term.
24. Deposits of minerals are depleted by mining and eventually exhausted.
25. Residual mineral deposits are substances that are concentrated through physical weathering processes.
26. Mineral deposits formed from midocean ridge volcanism are called volcanogenic massive sulfide deposits.
27. Volcanogenic massive sulfide (VMS) deposits (Cu-Zn) are associated with ancient ridge volcanism.
28. The dense chromite crystals settle to the bottom of the magma, producing almost pure layers of chromite.
29. The greatest period of coal swamp formation occurred during the Eocene and Miocene periods.
30. Intense chemical weathering is favored by the tropical climate.
31. Borax and other boron-containing minerals are mined from evaporite lake deposits in Death Valley.
32. Hydrothermal deposits typically form veins, replacements, and dissemination.
33. Stratabound deposits occur when hydrothermal fluids invade and react with muddy sediments.
34. Only oil shale that produces 40 liters of oil per ton is worth mining.
35. Most placers are found in geologically young stream gravels.
36. The most important minerals concentrated in placers are sulfides.
37. Iron ores formed as a result of metamorphism are called taconites.
38. Most strat-abound deposits are magmatic in origin.
39. Leaching of sulfides (Cu) close to the surface and depositing them at depth, forming rich blankets of copper.
40. The world's largest and richest lead and zinc deposits are strata-bound.
41. The world's principal deposits of chromite are in the Bushveld igneous complex in South Africa and the Great Dike in Zimbabwe.
42. Lake Superior-type iron can become an ore through metamorphism.
43. Pegmatites in many countries yield beryl, one of the main ore minerals of beryllium.
44. High-grade metamorphism of marine evaporite deposits causes another important mineral, sylvite (KCl), to form from carnallite.
45. Huge evaporite deposits of sodium carbonate were laid down in the Green River basin of Wyoming during the Eocene Epoch.
46. Much of the world's lithium is mined from ultramafic rocks.
47. Pb-Zn deposits are non-metallic mineral deposits.
48. Ore minerals rarely occur alone.
49. Gangue may include quartz, feldspar, mica, calcite, or dolomite.
50. Metallogenic provinces are limited regions of the crust within which mineral deposits occur in unusually large numbers.



**Fourth Level Examination in
Sedimentary Basins & Sequence stratigraphy (G420)
For Geology and Geophysics students (summer course)**

Time: Two Hours

(50 degree)

29 Aug., 2024

PART-I: Sequence Stratigraphy (25 degree)

I-Choose the correct answer for the following statements

(8 marks)

- 1. The movement of coastline landward in response to a transgression; can occur during sea level rise with low sediment influx.**
 - a. Retrogradational
 - b. formation
 - c. progradational
 - d. accomodation
- 2. Sequence stratigraphy focuses on**
 - a. Paleoecological frameworks characterized by unique fossil assemblage
 - b. The order in which the strata accumulated combined with depositional and erosional surface frameworks to interpret depositional settings
 - c. Basin modeling and sea level
 - d. Astroblemes and other allochthonous events that can have local and regional implications, resulting in unique traps
- 3. Bounding surfaces**
 - a. Are subdividing surfaces of the sedimentary section and are commonly generated by the changing relative sea level.
 - b. Surfaces that never tie to rebounds due to isostasy and eustasy.
 - c. Are boundaries that never have to do shales and TOC, and cannot be considered key indicators of the kitchen.
 - d. Are blurring surfaces that have to do with fracture patterns.
- 4. Stacking patterns include**
 - a. Parasequence
 - b. Progradation
 - c. Retrogradation
 - d. Transgression
 - e. All of the above
- 5. A systems tract consists of**
 - a. The regressive deposits that form when sediment accumulation rates exceed the rate of relative sea-level rise
 - b. Genetically associated stratigraphic units that were deposited during specific phases of the relative sea-level cycle
 - c. Tectonically active basins that adjoin each other

6. A highstand systems tract consists of

- a. All the transgressive deposits that accumulated after the onset of a relative sea-level fall and before the start of the next relative sea-level rise
- b. All the regressive deposits that accumulated after the onset of a relative sea-level fall and before the start of the next relative sea-level rise
- c. Deposits that accumulate after the onset of relative a sea-level rise
- d. Deposits that contain characteristic transform fractures that often stream biogenetic fluids

7. _____ formed when the transgressing sea reworks either the prior sequence boundary or the sediments that may have collected during the forced regression that may have followed the generation of that sequence boundary.

- a. Condensed sequences
- b. Ravinement erosion surface
- c. Contact metamorphism
- d. Secondary dolomite mixed with sphalerite

8. In sequence stratigraphy, what do you call the termination of more steeply dipping overlying strata against a surface or underlying strata that have lower apparent dips?

- a. Toplap
- b. onlap
- c. downlap

II- Answer the following questions

(5marks)

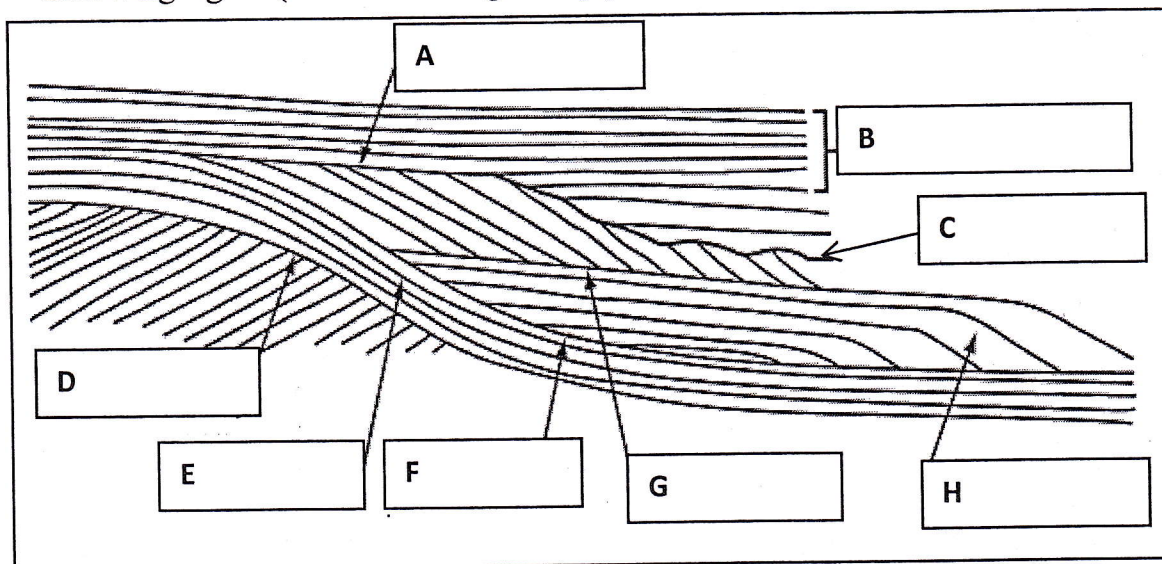
9- A depositional sequence is

10- Space available for sediment accumulation is known as

11- The main factors controlling global sea level change (eustasy) are:

a- b- c-

12 - **Identify the different types of seismic reflections and terminations** given in the following figure (Write in the eight empty boxes, from A to H). **(8marks)**



A.....
C.....
E.....
G.....

B.....
D.....
F.....
H.....

III- True or False? (Circle the correct answer).

(4marks)

13. Eustasy can vary by changing ocean-basin volume (Vary ocean-ridge volume). **True or False?**
14. Regression means seaward migration of littoral facies **True or False?**
15. Parasequence set composes a systems tract; a relatively conformable sequence of genetically related beds; bounded by marine-flooding surfaces. **True or False?**
16. Progradational means the movement of coastline landward in response to a transgression. **True or False?**

PART-II: Sedimentary Basins (25 degree)

I-Chose the correct answer

(1 mark)

1. A sedimentary basin is.....

- a. a plain area in the Earth's crust, of tectonic origin, in which sediments accumulate.
- b. a low area in the Earth's crust, of tectonic origin, in which sediments accumulate.
- c. a place where uplift of the Earth's crust has allowed sediments to erode on top of a basement of igneous and metamorphic rocks.
- d. none of the above.
- e. both (a) and (b).

(1 mark)

2. Rift basin is.....

- a. a normal fault bounded basin that develops during extension of continental lithosphere.
- b. elongate depression overlying a place where the lithosphere has ruptured in extension.
- c. none of the above.
- d. all of the above.

3. According to their tectonic settings sedimentary basins are..... **(1 mark)**

- a. variously termed arches, paleo highs, schwelle, axis of uplift, or positive areas.
- b. circular or more frequently elongate depressions, troughs, or embayments, but often they may have quite irregular boundaries.
- c. post-depositional, syn-depositional, or pre-depositional basins.
- d. both (a) and (b).
- e. none of the above.
- f. all of the above.

4. Basins are separated from another by..... **(1 mark)**

- a. raised linear areas.
- b. fault scarps.
- c. dépression.
- d. plane surface areas.
- e. both (a) and (d).
- f. all the above.

5. Which of the following compounds found in the sedimentary basins plays an important role in the production of natural gas and petroleum **(1 mark)**

- a. Hydrocarbons
- b. Graphite
- c. Copper
- d. Silicon

6. A sedimentary basin has an axis, a line connecting..... **(1 mark)**

- a. The highest structural points of the basin.
- b. The lowest structural points of the basin.
- c. the mid-point between lowest and highest points of the basin.
- d. none of the above.

7. Primary aspects of classification and evolution of sedimentary basins are..... **(1 mark)**

- a. whether a basin is formed on an oceanic crust or on a continental crust.
 - b. proximity of the basin to a plate boundary.
 - c. the nature of the nearest plate boundary.
 - d. both (a) and (c).
 - e. all the above.
8. The failed arm of a continental rift is called.....(1 mark).
 a. hot spot b. horst c. decollement d. aulacogen
9. Which of the following is not an example of basin-shaped structures formed by flexural folding..... (1 mark)
 a. synclines b. anticline
 c. sedimentary basins d. foreland basins
10. The tectonic settings of basin formation are (1 mark)
 a. weathering, erosion and transportation then cementation.
 b. divergent; convergent; transform and transcurrent; and hybrid.
 c. all the above.
 d. none of the above.

II - Chose the correct answer

11. Basin relief can be created mechanically on a regional scale in two very important ways: thermally or flexurally, or by a combination of those two effects (1 mark)
 a. True
 b. False
12. A sedimentary basin has an axis, a line connecting the lowest structural points of the basin; the axis of trough may plunge (1 mark)
 a. True
 b. False
13. On a small scale, hundreds to thousands of meters laterally, fault movements can create relief resulting in small but often deep basins (1 mark)
 a. True
 b. False
14. Tectonics is needed to make sedimentary basins, but the record of the basin itself is sedimentary (1 mark)
 a. True
 b. False
15. A trench is an elongated deep trough formed on the subducting oceanic plate. It represents the deepest sedimentary basin (1 mark)
 a. True
 b. False
16. A rift is a normal fault bounded basin that develops during extension of continental lithosphere (1 mark)
 a. True

- b. False
17. Aulacogens are the third, unsuccessful arm of the triple junction stops spreading and form elongated zones of subsidence at a steep angle to the eventual continental margins (1 mark)
a. True
b. False
18. Certain basins may show a complex history and therefore contain pre-tectonic as well as syn-tectonic or post-tectonic sediments (1 mark)
a. True.
b. False.
19. Embayments are basins that are not completely closed structurally, but which open out into a deeper area (1 mark)
a. True.
b. False.
20. A sedimentary basin can be made just by erecting high land in an adjacent area by volcanism (1 mark)
a. True.
b. False.

III- Fill in the spaces with suitable geologic terms

21. is the part of the basin with the thickest sedimentary fill (1 mark)
22. According to their tectonic settings are post-depositional, syn-depositional, or pre-depositional basins (1 mark)
23.basin occurs within the cratonic areas (1 mark)
24. is an elongated deep trough formed on the subducting oceanic plate. It represents the deepest sedimentary basin (1 mark)
25. is a failed arm of a three-armed rift system, two of whose arms continued to evolve to form ocean basins (1 mark)

-----**GOOD LUCK**-----
Prof. Dr. Ahmed-Reda El Younsy

Prof. Dr. Abdalla El Ayyat

(29Aug, 2024)

Credit hour system - summer semester - Final Examination
Geology and Geophysics Programs
Economic Geology (G 434)

Fourth Level

Allowed time 2 hour

ملحوظة: الامتحان في صفتين
(50 M) الجزء التحريري

Answer (T) for True sentences Or (F) for False sentences: (One mark each)

- 1- Oil Shale is the most abundant fossil fuel.
- 2- One of the largest nickel deposits ever found, in New Caledonia, was formed by secondary enrichment.
- 3- Mineral deposits are any volume of rock containing an enrichment of one or more minerals.
- 4- Most ore minerals of the scarce metals are oxides.
- 5- Gangues are defined as waste materials associated with ores.
- 6- Volcanogenic massive sulfide deposits associated with mid-ocean ridge volcanism.
- 7- Porphyry Cu, Mo deposits are commonly associated with plutonic and ultramafic igneous rocks.
- 8- Residual deposits are formed by removal of soluble minerals (leaching)
- 9- Calcareous (e.g., limestone, dolostone) rocks are most suitable for the formation of skarns.
- 10- Gypsum, phosphate, halite are metallic mineral deposits.
- 11- Mineralogy often changes within an orebody and hence during the life of a mine.
- 12- Metallogenic Provinces are limited regions of the crust within which mineral deposits occur in unusually large numbers.
- 13- Ore type often changed from a hematite to magnetite during weathering.
- 14- Residual mineral deposits substances that are concentrated by chemical weathering processes, i.e. bauxite.
- 15- Placer deposits occur where barriers allow flowing water to carry away the suspended load of light weight particles, while trapping heavy particles.
- 16- Pegmatites are crystallized from volatile-poor fluids.
- 17- Stratabound Deposits occur when hydrothermal fluids invade and react with muddy sediments
- 18- Porphyry copper deposits are copper orebodies which are associated with porphyritic intrusive rocks and the fluids that accompany them during the transition and cooling from magma to rock.
- 19- Placer deposits are any concentration of minerals formed through processes of sedimentation.
- 20- Metallic minerals are those from which metals such as Cu, Au, Fe, & Zn can be recovered by smelting.
- 21- Veins type deposits are formed when hydrothermal solutions deposited minerals in open fractures.
- 22- Iron ores formed as a result of metasomatism are called taconites.

- 23-The type of orebody has a big influence on the choice of mining method
- 24-Nonrenewable resource is on that if replenished by natural processes, growth times are measured in millions of years rather than in annual seasons.
- 25-Volcanogenic massive sulfide deposits are poor in copper and zinc.
- 26-Pegmatites in many countries yield beryl.
- 27-Deposits of minerals are depleted by mining and eventually exhausted.
- 28-Ore grade increases by metamorphism.
- 29-Ore is defines as a mineral or an aggregate of minerals from which a valuable constituent - particularly a metal can be extracted profitably.
- 30-For gold mining, the gossan is mined because it is more easily accessible and naturally enriched and is easier to recover
- 31-All of the very large bauxite deposits formed more than 25 million years ago.
- 32-Asbestos is characterized by good tensile strength and good insulation.
- 33-Gypsum and halite considered as industrial minerals.
- 34-Mineral Deposits are concentrated by hot, aqueous solutions flowing through fractures and pore spaces in crustal rock to form magmatic mineral deposits
- 35-The quantity of a given mineral available in any one country is rarely known with accuracy.
- 36-The dense chromite crystals settle to the bottom of the magma, producing almost pure layers of chromite
- 37-High-grade metamorphism of marine evaporite deposits causes another important mineral, sylvite (KCl), to form from carnallite.
- 38-Chrysotile asbestos is mainly mined in Canada.
- 39-Mineral paragenesis and intergrowth are important bases for the subsequent mineral processing.
- 40-Many famous ore bodies are associated with extrusive igneous rocks.
- 41-Borax and other boron-containing minerals are mined from evaporite lake deposits.
- 42-In black smokers, the rising hydrothermal fluid appears black due to fine particles of iron sulfide and other minerals precipitated from solution as the plume is cooled by contact with cold seawater.
- 43-Metasomatic deposits are formed by evaporation of lake water or seawater.
- 44-Evaluation of ore deposits depends on market location, transportation costs, their physical and chemical characteristics, and the degree of processing required for end use.
- 45-Ore within the weathered cap is called gossan.
- 46-Much of the world's lithium is mined from sedimentary rocks such as those at King's Mountain, North Carolina.
- 47-Sphalerite, galena, and chalcopryrite are ore minerals from which zinc, lead, and copper respect.
- 48-Most stratabound deposits are diagenetic in origin
- 49-Examples for late magmatic deposits are chromite, magnetite, & PGE.
- 50-The disseminated type ore deposit has a 'cap' of weathered sulphides (hence oxides) on the top of the orebody.

Credit hour system - summer semester - Final Examination
Geology and Geophysics Programs
Economic Geology (G 434)

Fourth Level

Allowed time 2 hour

ملحوظة: الامتحان في صفتين

(50 M) الجزء التحريري

Answer (T) for True sentences Or (F) for False sentences: (One mark each)

- 1- Oil Shale is the most abundant fossil fuel.
- 2- One of the largest nickel deposits ever found, in New Caledonia, was formed by secondary enrichment.
- 3- Mineral deposits are any volume of rock containing an enrichment of one or more minerals.
- 4- Most ore minerals of the scarce metals are oxides.
- 5- Gangues are defined as waste materials associated with ores.
- 6- Volcanogenic massive sulfide deposits associated with mid-ocean ridge volcanism.
- 7- Porphyry Cu, Mo deposits are commonly associated with plutonic and ultramafic igneous rocks.
- 8- Residual deposits are formed by removal of soluble minerals (leaching)
- 9- Calcareous (e.g., limestone, dolostone) rocks are most suitable for the formation of skarns.
- 10- Gypsum, phosphate, halite are metallic mineral deposits.
- 11- Mineralogy often changes within an orebody and hence during the life of a mine.
- 12- Metallogenic Provinces are limited regions of the crust within which mineral deposits occur in unusually large numbers.
- 13- Ore type often changed from a hematite to magnetite during weathering.
- 14- Residual mineral deposits substances that are concentrated by chemical weathering processes, i.e. bauxite.
- 15- Placer deposits occur where barriers allow flowing water to carry away the suspended load of light weight particles, while trapping heavy particles.
- 16- Pegmatites are crystallized from volatile-poor fluids.
- 17- Stratabound Deposits occur when hydrothermal fluids invade and react with muddy sediments
- 18- Porphyry copper deposits are copper orebodies which are associated with porphyritic intrusive rocks and the fluids that accompany them during the transition and cooling from magma to rock.
- 19- Placer deposits are any concentration of minerals formed through processes of sedimentation.
- 20- Metallic minerals are those from which metals such as Cu, Au, Fe, & Zn can be recovered by smelting.
- 21- Veins type deposits are formed when hydrothermal solutions deposited minerals in open fractures.
- 22- Iron ores formed as a result of metasomatism are called taconites.

- 23-The type of orebody has a big influence on the choice of mining method
- 24-Nonrenewable resource is one that is not replenished by natural processes, growth times are measured in millions of years rather than in annual seasons.
- 25-Volcanogenic massive sulfide deposits are poor in copper and zinc.
- 26-Pegmatites in many countries yield beryl.
- 27-Deposits of minerals are depleted by mining and eventually exhausted.
- 28-Ore grade increases by metamorphism.
- 29-Ore is defined as a mineral or an aggregate of minerals from which a valuable constituent - particularly a metal can be extracted profitably.
- 30-For gold mining, the gossan is mined because it is more easily accessible and naturally enriched and is easier to recover
- 31-All of the very large bauxite deposits formed more than 25 million years ago.
- 32-Asbestos is characterized by good tensile strength and good insulation.
- 33-Gypsum and halite considered as industrial minerals.
- 34-Mineral Deposits are concentrated by hot, aqueous solutions flowing through fractures and pore spaces in crustal rock to form magmatic mineral deposits
- 35-The quantity of a given mineral available in any one country is rarely known with accuracy.
- 36-The dense chromite crystals settle to the bottom of the magma, producing almost pure layers of chromite
- 37-High-grade metamorphism of marine evaporite deposits causes another important mineral, sylvite (KCl), to form from carnallite.
- 38-Chrysotile asbestos is mainly mined in Canada.
- 39-Mineral paragenesis and intergrowth are important bases for the subsequent mineral processing.
- 40-Many famous ore bodies are associated with extrusive igneous rocks.
- 41-Borax and other boron-containing minerals are mined from evaporite lake deposits.
- 42-In black smokers, the rising hydrothermal fluid appears black due to fine particles of iron sulfide and other minerals precipitated from solution as the plume is cooled by contact with cold seawater.
- 43-Metasomatic deposits are formed by evaporation of lake water or seawater.
- 44-Evaluation of ore deposits depends on market location, transportation costs, their physical and chemical characteristics, and the degree of processing required for end use.
- 45-Ore within the weathered cap is called gossan.
- 46-Much of the world's lithium is mined from sedimentary rocks such as those at King's Mountain, North Carolina.
- 47-Sphalerite, galena, and chalcopyrite are ore minerals from which zinc, lead, and copper respect.
- 48-Most stratabound deposits are diagenetic in origin
- 49-Examples for late magmatic deposits are chromite, magnetite, & PGE.
- 50-The disseminated type ore deposit has a 'cap' of weathered sulphides (hence oxides) on the top of the orebody.

بسم الله الرحمن الرحيم

جامعة أسيوط

كلية العلوم - قسم الجيولوجيا

امتحان التحريرى للمستوى الرابع بكلية العلوم شعبة الجيولوجيا والكيمياء

المادة: خريطة مصر الجيولوجية (٤١٠ ج)

Geologic Map of Egypt (410 G)

الفصل الدراسى الصيفى ٢٠٢٣/٢٠٢٤ م الدرجة: ٥٠ درجة الزمن: ساعتان

ملحوظة: الامتحان يتكون من صفحتين

Answer the following questions:

First Question: choose the correct answer (10 Marks)

- 1- The Eocene rocks in Egypt has important.
A- scientific B- economic C- tourist d) all of these
- 2- The Global Stratotype Section and Point for the Paleocene/Eocene (GSSPP/E) boundary is located at
A- Dababiya Village, Egypt B- Duwi Mountain, Egypt
C- El Keif, Tunisia D- Bahariya Oasis, Egypt
- 3- What is the proper order of the periods of the Paleozoic Era?
A- Cambrian, Devonian, Ordovician, Silurian, Carboniferous, Permian
B- Cambrian, Ordovician, Silurian, Devonian, Carboniferous, Permian
C- Cambrian, Silurian, Ordovician, Devonian, Carboniferous, Permian
D- Cambrian, Silurian, Ordovician, Devonian, Carboniferous, Permian
- 4- During which geologic period did the Red Sea Rift take place?
A- Neogene B- Paleogene C- Paleozoic D- Archean
- 5- The Paleozoic rocks are missing at the part of Egypt.
A- southern B- northern C- eastern D- middle
- 6- The Umm Bogma Formation differs from Northern Wadi Malik Formation in.
A- Geologic age B- depositional environment
C- both of them D- none of them
- 7- The Burg El Arab Formation is than/to the Mersa Matrouh Formation.
A- older B- younger C- equivalent D- None of these
- 8- The Triassic rocks are exposed in the Egyptian regions.
A- northern B- southern C- both of them D- None of them

9- What is the name for unconformity that separate between two sets of sedimentary layers with no field criteria?

A- Nonconformity

B- Disconformity

C- Angular unconformity

D- Paraconformity

10- The age of the Resan Aneizan Formation is

A- Early Cretaceous

B- Late Cretaceous

C- Early Jurassic

D- Early Triassic

Second Question: (10 Marks)

1- In a stratigraphic table write and arrange the subsurface Paleozoic rock units in Egypt.

2- Construct a stratigraphic table for the Neogene rock units at the Nile Delta.

Third Question: (10 Marks)

1- Define the geologic age and the stratigraphic relationship for five only of the following rock units: (5 Marks)

A- Khoman & Hafhuf

B- Maghrabi & Raha

C- Taref & Qusier

D- Dunql & Thebes

E- Abu Dabab & Rositta

F- Abu Balas & Sabaiya

2- Explain the presence of few occurrence of few exposures of the Hammamat sediments in the northern part of the basement belt of Egypt? (5 Marks)

Fourth Question: (10 Marks)

Write on the main rock units forming the ophiolite sequences cropping out in the Eastern Deseret of Egypt

Fifth Question: Compare between the following pairs: (10 Marks)

A- Grey Granites – Younger Granites

(5 marks)

B- Old Metavolcanics (OMV) – Younger Metavolcanics (YMV)

(5 marks)

Good Luck

Prof. Dr. Ali A. Khudier

Prof. Dr. Nageh A. Obaidalla