

Part (2) - INDUSTRIAL MINERALS AND ROCKS (25 M)

Answer three questions only of the following (25M)

Q1 (5 M)

- i- Identify and explain various minerals utilized in construction and chemical applications.
- ii- Discuss the environmental applications of industrial minerals.

Q2 (5 M)

- i- Examine the uses of the following industrial minerals: galena, gypsum, graphite, dolomite, and garnet.
- ii- Discuss the industrial applications of kaolin deposits?

Q3 (5 M)

- i. What are the uses of industrial minerals in the plastics and polymers sector?
- ii. Explain the applications of industrial minerals used in the paint and ceramics industry?

Q4 (5 M)

- i. Explain the types and uses of green and critical minerals?
- ii. Discuss the uses of industrial minerals in the adhesives and sealants sector?

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

1. Luster refers to the way light is reflected off the surface of a mineral.
2. Perlite is water-bearing natural glass that contains silica, alumina, iron, titanium, calcium, magnesium, sodium and potassium oxides.
3. Barite-based concrete can reduce lead shielding at nuclear facilities.
4. Drilling mud uses feldspar for density control.
5. The streak plate has a hardness of glass, so minerals with a Mohs Hardness >7 will scratch the plate instead of powdering the mineral.
6. Minerals are classified by their chemical composition and internal crystal structure.
7. Graphite is an excellent electrical insulator.
8. Ferromagnesian minerals include muscovite, feldspar, and quartz.
9. For some minerals, color is directly related to one of the major elements and can be characteristic and serve as a means of identification.
10. Streak can be useful for identifying metallic and earthy minerals.

تمت الأسئلة و بالتوفيق

أ.د. عوض عبد الخالق عمران

أ.د. جلال حامد الحباك

Q2 - Put (T) for true sentence or (F) for false sentence: (5 Marks)

- 1- The key requirement for initiating an exploration program for minerals is creating detailed geological maps ().
- 2- Remote sensing relies on measuring x-rays to determine the composition of mineral ores ().
- 3- Active geophysical techniques are used to measure changes in gravity and magnetism in a specific area for the purpose of mineral exploration ().
- 4- Geochemical prospecting is used to determine the chemical compositions of minerals found underground ().
- 5- GIS methods are used only for military purposes and are seldom involved in mineral exploration ().

Q3- Answer THREE ONLY of the following FOUR questions: (5 Marks for each question)

- 1- a) Clarify the main three items that geochemical prospecting are based on?
b) Select three of geochemical methods and explain how are used in mineral prospecting processes and give examples of ore deposits located by each method?
- 2- a) Illustrate the role of gravity method in detecting mineral ores directly and indirectly indicating the targeting ores in each case.
b) What are the different instruments necessary for remote sensing techniques and show how can be applied for mineral exploration?
- 3- a) What are the measured parameter, units, tools and main anomaly causes in radioactivity method of prospecting for mineral deposits?
b) What are the instruments necessary for modern photogeological exploration? Explain the different approaches used for extracting geological information from aerial photographs in mineral exploration.
- 4- a) What are the well logging methods applied for mineral exploration? List the type of mineral ores that can be located using each method?
b) Explain how radioactive mineral deposits can be recognized in the direct application of radioactivity method?

بقية الأسئلة في الصفحة الثالثة



Part (1) - MINERAL PROSPECTING (25 Marks)

Answer the following questions:

Q1- Select the correct answer: (5 Marks)

1- Which instruments are mentioned as being used for mapping at scales of 1:25,000 and 1:10,000 in prospecting purposes?

- A. Aerial photographs and satellite images.
- B. GPS survey instruments and theodolite.
- C. Drill holes and mine workings.
- D. Rock/soil sampling tools.

2- What is an indicator of the likely existence of mineral deposits at depth?

- A. Ancient mining techniques.
- B. Shear zones.
- C. Surface weathering of metallic deposits.
- D. Lineament patterns.

3- Which factor is NOT mentioned as important for the planning of a prospecting project?

- A. Selection of Professional Geologist Leadership.
- B. Selection of Area.
- C. The Prospecting processes.
- D. Budget allocation.

4- What is the simplest method for conducting a topographic survey in mineral prospecting?

- A. Using electronic total stations.
- B. Using a tape and compass.
- C. Employing aerial photography.
- D. Utilizing GPS technology.

5- What is essential for the long- and short-term purposes of any type of mineral exploration project?

- A. Chemical analytical laboratory.
- B. Accurate topographic map.
- C. Field operation techniques.
- D. Geological mapping.

بقية الأسئلة في الصفحة الثانية

7. Gangues are defined as waste materials associated with ores.
8. Many famous ore bodies are associated with extrusive igneous rocks.
9. Tin and tungsten deposits are associated with mafic igneous rocks.
10. Metallic minerals are those from which metals such as Cu, Au, Fe, & Zn can be recovered by smelting.
11. Galena, chalcopyrite and sphalerite are ore minerals from which zinc, lead, and copper can be extracted, respectively.
12. Mineral deposits are any volume of rock containing an enrichment of one or more minerals.
13. Oil Shale is the most abundant fossil fuel.
14. Metallogenic Provinces are limited regions of the crust within which mineral deposits occur in unusually large numbers.
15. Porphyry Cu, Mo deposits are commonly associated with plutonic and ultramafic igneous rocks.
16. Most ore minerals of the scarce metals are oxides.
17. The type of orebody has a big influence on the choice of mining method
18. Nonrenewable resources, if replenished through natural processes, require millions of years for regeneration rather than the annual cycles typical of renewable resources.
19. A significant nickel deposit, among the largest ever discovered, located in New Caledonia, was formed through sedimentary processes.
20. A reserve is defined as a resource that can be extracted profitably at current market conditions and levels of technology

انتهت الأسئلة وبالتوفيق

Credit hour system - 2nd 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 three only of the following questions (30 M)

Q1(10 M)

- a. Discuss the importance and process of gossan formation and supergene enrichment.
- b. Compare between early and late magmatic deposits with examples.

Q2 (10 M)

- a. Mention the various types of hydrothermal mineral deposits.
- b. Differentiate between syngenetic and epigenetic mineral deposits, as well as the tenor and tonnage of a mineral deposit.

Q3 (10 M)

- a. Analyze the differences between metamorphic and metasomatic mineral deposits, providing examples for each.
- b. Compare between placers deposits and residual mineral deposits with examples.

Q4 (10 M)

- a. Discuss the formation of massive sulfide deposits and copper-nickel-sulfide association.
- b. Discuss the characteristics and formation processes of banded iron formations and ironstone deposits.

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

1. Ore type often changed from a magnetite to hematite (martite) during weathering.
2. Most industrial minerals are of low volume.
3. Mineralogy often changes within an orebody and hence during the life of a mine.
4. Syngenetic Cu-Ni sulfides are associated with granitic rocks.
5. Gypsum, phosphate and halite are metallic mineral deposits.
6. Sulfide-rich liquid found in the silicate magma is homogeneous at lower and immiscible at high temperatures.

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- Gypsum, phosphate and halite are metallic mineral deposits.
- Sulfide-rich liquid found in the silicate magma is homogeneous at lower and immiscible at high temperatures.

ANSWER ONLY THREE OF THE FOLLOWING QUESTIONS:

III- Give reasons for each of the following: (10 marks)

- A) The SPOT satellite's scenes are characterized by the possibility of being displayed and analyzed as a three-dimensional model.
- B) Thermal remote sensing is a type of passive sensing.

IV- Compare between the following: (10 marks)

- A - Remote sensing data collected by the Second generation and the Third generation of Landsat Earth Observation satellites.
- B- Real Aperture and Synthetic aperture Radar imagery.

V- The electromagnetic spectrum is divided into many bands that are used in remote sensing techniques. Mention four of these bands and how to collect data for each of them.

(10 marks)

VI- Give a brief account on each of the following:

- A) Spectral and spatial resolution of a remote sensing sensor.
- B) Cross-track and Along track scanners.

(10 marks)

GOOD LUCK!

Prof. Dr. Moustafa Youssef



كلية العلوم - قسم الجيولوجيا



جامعة أسيوط

امتحان طلاب المستوى الرابع (ساعات معتمدة)
مقرر (٤٤٥ ج) جيولوجيا تصويرية واستشعار عن بعد

Photo-geology and Remote Sensing

الزمن : ساعتان الدرجة الكلية (٥٠ درجة) مايو ٢٠٢٥

ANSWER THE FOLLOWING TWO QUESTIONS:

- I- Complete the following sentences by appropriate word(s), then **rewrite the complete sentence in your answer paper:** (10 marks)
- 1- Remote sensing systems that measure naturally available energy are called.....
 - 2- Transmittance and absorption during interactions between electromagnetic radiation and matter are called.....
 - 3- The sensors in the second generation of Landsat satellites sense electromagnetic radiation from the Earth's surface inbands..
 - 4- The focal length of the photographic lens is shown on aerial photographs so that it can be used to calculate
 - 5- Satellites that see the same part of the Earth's surface at all times haveorbits.
 - 6- In the electromagnetic spectrum; the Thermal infrared region extends from.....to.....
 - 7- Sensors collect information from different wavelengths and store each in an independent channel, referred to as
 - 8- During the interactions between electromagnetic radiation and matter, emission, scattering, and reflection are called.....
 - 9- Electromagnetic radiation waves are classified according to their lengths intostarting from very short rays to long waves.
 - 10- Landsat satellites cover a strip of land below orbit with a width of

II -Write short notes on each of the following: (10 marks)

- a- Sun synchronous satellite orbits.
- b- Microwave remote sensing.

باقي الأسئلة في الصفحة التالية

ii- Discriminate between the Cenomanian rock units at Sinai and Bahariya Oasis.

III- A- Write the geologic age of the following rock units (formations) and discuss the stratigraphic relationship between every two formations. (5 Marks)

i- Wadi Malik/Lakia
iv- Six Hills/Abu Ballas

ii- Safa/Massajid
v- Tamsah/Wata

iii- Bahrien/Wadi Natrun

B- Write short notes on the main characters and the lithological composition of the ophiolites occurring in the Eastern Desert of Egypt. (5 Marks)

IV- Discuss briefly the tectonic history of the Egyptian basement within the light of the geosynclinal concept. (10 Marks)

V- Correlate briefly between the lithologic classifications of the Egyptian basement within the light of the old geosynclinal and plate tectonic concepts. (10 Marks)

انتهت الأسئلة مع أطيب الأمنيات بالتوفيق

أ.د/ ناجح عبدالرحمن عبده

أ.د/ على عبدالقادر خضير

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

جامعة أسيوط

كلية العلوم - قسم الجيولوجيا

امتحان المستوى الرابع بكلية العلوم شعبة الجيولوجيا والكيمياء

المادة: خريطة مصر الجيولوجية (٤١٠ ج)

(Geologic map of Egypt (410 G)

الزمن: ساعتان

الدرجة: ٥٠ درجة

الفصل الدراسي الثاني 2024/2025

الامتحان يتكون من صفتين

Final Examination (50 Marks)

I- Shade the correct answer A, B, C, or D (10 Marks, 1 mark each)

- 1- Chronostratigraphic units consist of
A- rocks B- fossils C- rock and fossils D- time intervals
 - 2- One of these is not type of the physical stratigraphy.
A- Sequence stratigraphy B- Lithostratigraphy
C- Magnitostratigraphy D- Biostratigraphy
 - 3- The arrangement of sedimentary rocks in separate layers is called
A- metamorphism B- stratification
C- precipitation D- solidification
 - 4- All rocks have character.
A- lithostratigraphic B- magnetostratigraphic
C- chronostratigraphic D- all of these
 - 5- Which of the following terms is an example of chronostratigraphic units?
A- age B- stage C- bed D- epoch
 - 6- Disconformity is inferred mainly by.....
A- fossils B- basal conglomerate C- irregular surfaces D- all of these
 - 7- The correct stratigraphic order of the Upper Cretaceous-Lower Paleogene rock units at Gebel Duwi region is.....
A- Dakhla, Tarawan, Esna B- Tarawan, Dakhla, Esna
C- Esna, Tarawan, Dakhla D- Dakhla, Esna, Tarawan
 - 8- The age of the Garra Formation is age.
A- Miocene-Pliocene B- Eocene-Oligocene
C- Oligocene-Miocene D- Paleocene-Eocene
 - 9- The Paleogene does not include the..... Epoch.
A- Pliocene B- Paleocene C- Oligocene D- Eocene
 - 10- The Raisan Aneiza Formation is than/to the Halal Formation.
A- older B- younger C- equivalent D- conformable
- II- A- Compare and correlate in a geologic time table the Eocene rock units at both the Sinai and Fayoum regions and write the important of each one if present (7 Marks)
- B- Write on only one of the following: (3 Marks)
- i- The Oligocene rocks in Egypt.



الامتحان التحريري النهائي لطلاب المستوى الرابع بكلية العلوم
(شعبة الجيولوجيا)
المقرر: بيئة الأحياء القديمة وطباقية حيائية (١٤ ج)
Palaeoecology & Biostratigraphy 414G
دور يونيو - العام الجامعي ٢٠٢٤-٢٠٢٥م



الزمن: ساعتان

الدرجة الكلية للامتحان: ٥٠ درجة

Q1: Shade (T) for true statements or (F) for false statements (10 marks; 1 mark each)

- 1- Fossils can be applied in modern ecology investigation.
- 2- A biocoenosis refers to organisms that fossilized together in a particular environment.
- 3- Terrestrial plants can be used as salinity indicators.
- 4- Total destruction can occur in many organisms during transport.
- 5- Preservation of fossils can be site specific.
- 6- Living organisms can be used to reconstruct ancient environments that contain their nearest living relatives.
- 7- Dating and correlation of sedimentary rocks is called biostratigraphy.
- 8- The "Concurrent Range Zone" is characterized by overlapping ranges of fossils.
- 9- All the animals which move in water or air must be streamlined.
- 10- The term "ecosystem" refers to living organisms and their controlling environmental variables.

Q2: Shade the correct answer; A, B, C or D (5 marks; 1 mark each)

- 1- A given fossil has a depositional history, which is termed
A- degradation B- diagenesis C- biostratigraphy D- necrology
- 2- In dinoflagellates, selective preservation result from
A- increased nitrate concentration B- increased bottom oxygen
C- reduced salinities D- increased chlorophyll-*a* concentration
- 3- Organisms that contribute to the fossil record must
A- have soft parts B- be robust C- be fauna D- be flora
- 4- Evolutionary changes in living organisms are
A- reversible B- rare C- nonreversible D- not common
- 5- *Acropora palmata* live in shallow restricted, turbulent water, ... environments.
A- continental B- deep marine C- modern open reef D- fluvial

Q3: Answer the following question: (15 marks; 5 marks each)

- Write in detail on **three only** of the following:
- A- Taphonomic processes B- Abundance biozones
C- Geographic dispersal of organisms D- Taxonomic uniformitarianism

Q4: Write shortly on **two only** of the following: (10 marks; 5 marks each)

- A- Paleontologic clocks B- Simplicity as an operational base in paleoecology
C- Bioerosion and dissolution

Q5: Write briefly on: (10 marks; 5 marks each)

- A- Species through time B- Database in paleoecology reconstruction

إنتهت الأسئلة مع أطيب الأمنيات بالتوفيق

Examiner:

Prof. Dr. Magdy S. Mahmoud (Geology Department)

C). Matching Sentences

(7 marks)

6. Marine Flooding Surface	a. Deposited by a relatively slow rise in sea level and the filling of incised valleys.
7. Incised Valley Fill	b. Marine beds immediately overlying non-marine beds, may contain clasts from underlying unit, may have mixed faunal assemblages
8. Transgressive Lags	c. A surface that separates younger from older strata, across which there is evidence of an abrupt increase in water depth
9. Type 1 Sequence is bounded	d. below by a type 1 sequence and above by a type 1 or type 2 sequence boundary
10. Transgressive Systems Tract	e. The lower-most systems tract associated with a type 2 sequence boundary. one or more weakly progradational to aggradational sequence sets
11. Type 2 Sequence is bounded	f. below by a type 2 sequence boundary and above by a type 1 or type 2 sequence boundary
12. Shelf Margin Systems Tract	g. The middle systems tract of both type 1 and type 2 sequences. One or more retrogradational parasequence sets.

D). Is it True or False

(3 marks)

13- The local tectonics and the rates of sedimentation have little or no effect on worldwide sea level changes. **True or False?**

14- The rate of influx of terrigenous clastic sediments and the change in relative sea level exert controls on sedimentation patterns in coastal areas and on the continental shelf. **True or False?**

15- Water depth equal relative sea level (RSL) minus accumulated sediment **True or False?**

-----GOOD LUCK-----

Prof. Dr. Ahmed-Reda El Younsy

(23- May, 2025)

11- Sedimentary basins are regions of the Earth's crust occurred by
a. compaction b. lithification c. subsidence d. uplift

12- Oceanic basin is formed due to
a. convergence b. divergence c. strike-slip d. all of them

13. Which of the following compounds found in the sedimentary basins plays an important role in the production of natural gas and petroleum

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

III- True or False? Circle the correct answer (5 marks; 1 each one)

14. embayments are basins that are not completely closed structurally, but which open out into a deeper area. True or False?

15. the axis of a basin is a line connecting the lowest structural points of the basin, as in a synclinal axis. True or False?

16. a geosyncline is large trough like or basin like down warping of the crust in which thick sedimentary and volcanic rocks accumulated. True or False?

17. sedimentary basins are separated from another by raised linear areas termed arches, palaeohighs, schwelle, or positive areas True or False?

18. Tectonics is needed to make sedimentary basins, but the record of the basin itself is sedimentary. True or False?

PART-II: Sequence Stratigraphy (25 degree)

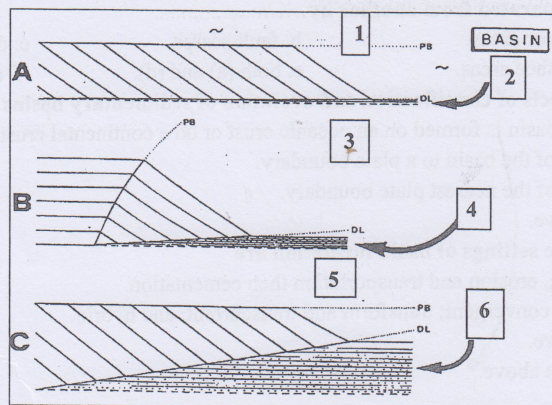
Answer the following questions (*Illustrate your answer by diagrams*):

A). Write shortly on THREE ONLY of the following:

(9 marks)

1. Define and distinguish between the concepts of transgressions vs. regressions.
2. Describe 1st, 2nd, 3rd, 4th and 5th order relative sea level cycles in terms of the time periods over which they operate and the possible causative mechanisms.
3. What is a parasequence and how are the bounding surfaces recognized?
4. Explain how regression might occur during relative sea-level rise.

B). 5. Discuss the relationship between platform break plane and downlap plane that can be used to understand the depth evolution of a basin, and recognize the different situations given in the following figure below at squares 1, 2, 3, 4, 5 and 6. (6 marks)





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

Time: Two Hours

(50 degree)

23-May-2025

PART-I: Sedimentary Basins (25 degree)

I- Answer TWO ONLY of the following question:

(10 marks; 5 each one)

1. Provide a definition of a sedimentary basin and a basic description of how they form.
2. How are sedimentary basins classified?
3. Describe the concept of an intracontinental basin and how they differ from marginal marine basins.

II- Choose the correct answer

(10 marks; 1 each one)

4. Sedimentary basins can be classified according to type of sediments into
 - a. siliciclastic-dominated basin
 - b. carbonate dominated basin
 - c. mixed carbonate-siliciclastic basin
 - d. all of them
5. Trench basin is related to
 - a. convergence
 - b. divergence
 - c. pull- apart
 - d. all of them
6. 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.
7. Aulacogens are
 - a. the second, failed arm of a three-armed rift, two of whose arms continued to open to form an ocean basin.
 - b. aulacogens start at the passive continental margin.
 - c. extending from the margins toward the open sea.
 - d. both (a) and (c).
8. Basins are separated from another by
 - a. raised linear areas.
 - b. fault scarps.
 - c. dépression.
 - d. plane surface areas.
 - e. both (a) and (d).
 - f. all the above.
9. Primary aspects of classification and evolution of sedimentary basins are
 - 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. all the above.
10. The tectonic settings of basin formation are
 - a. weathering, erosion and transportation then cementation.
 - b. divergent; convergent; transform and transcurrent; and hybrid.
 - c. all the above.
 - d. none of the above.

11- Lower stages of oxidation gives the most mobile of Mn ions..

- A. True
B. False (if false, please correct the wrong)

12- Which one of the following is NOT typical for the " Reduzates

- A. They are the opposites of the oxidates.
B. They formed in strongly reducing environments .
C. They are deposited in land-locked waters and in other places of poor circulation.
D. Coal and petroleum which are organogenic sediments are not belong to reduzates.
E. The reduzates are not include muds or black shale

13- There is an important and consistent decreases in $\delta^{13}\text{C}$ with depth of water

- A. True
B. False (if False, why?)

14- The marine organic matter (very +Ve in $\delta^{13}\text{C}$) is dominantly remove from surface waters but is commonly re-oxidized and the heavy C returned to the DIC, after the death of the organisms in deeper water and on sea floor.

- A. True
B. False

15- In Sulphidic environments, the diagenetic sequence has reached the stage at which the bacterial reduction of dissolved sulphate takes place with production of H_2S .

The H_2S would react with the chalcophile elements to produce sulfides.

Give three examples by chemical equations? (3 marks)

- A. ----
B. ----
C. ----

16- Give possible explanations for the following geochemical signatures in stratigraphic record: (4 marks)

- A. Sharp decrease in $\delta^{18}\text{O}$ associated with increase in fresh water sediments
B. Sharp decrease in $\delta^{18}\text{O}$ associated with increase in Al-rich sediments

Part II- Geochemistry of sedimentary rocks

Select or write the correct answer for the following : (1- 14, one mark for each)

1-In chemical weathering, acidic water with pH 0-7 possesses

- A. Intermediate decomposition action
- B. Strong decomposition action
- C. decomposition rate depends on the difference between the pH of the solution and the pH of the pure water.
- D. Rather weak decomposition action

2- Write by the chemical equation the extensive dissolution of the mineral Fayalite in nature?

.....
.....

3- Above the pH of 4, alumina is almost:

- A. Soluble
- B. Insoluble
- C. Stable

4- Write by the chemical equation the effect of chemical weathering on the mineral albite

.....

5-Write by the chemical equation the hydration of the mineral goethite

.....
.....

6- At higher values of pH (above 9), the solubility of quartz is:

- B. Decreases
- B. Increases
- C. Stable

7-Write by the chemical equation the hydrolyses of the mineral forsterite

.....
.....
.....

8- The argillaceous (Hydrolyzates) substances are characterized by the following, EXEPT:

- A. Their occurrence as solid insoluble particles
- B. Their transportation as suspended particles
- C. Their certainly smaller particle size
- D. They consist partly of the chemically undecomposed materials
- E. They entirely composed of amorphous materials

9-The main source rocks of the soil "Laterite" are:

.....

10-Which one of the following is NOT typical for the " oxides "

- A. Ferrous sulphate oxidized to Ferric hydroxide
- B. Magnetite, ilmenite, chromite are resistance to weathering.
- C. Sulphide minerals of iron oxidized to ferrous sulphate and H_2SO_4 .
- D. Silicates containing ferrous iron are resistant to weathering

Assiut University - Faculty of Science
Geology Department



جامعة أسيوط - كلية العلوم
قسم الجيولوجيا

First Semester Final Examination Subject: Course No. G433 (Geochemistry)
Students: B.Sc. Students (Geology and Geology/Chemistry Programs), Date: May, 25, 2025

Geochemistry Time allowed: one hour
Examiner: Prof. Dr. Ali A. Khudeir and Mamdouh F. Soliman

الامتحان في أربع صفحات

Part I- Geochemistry of Igneous and Metamorphic Rocks

Answer the following question (20 Marks)

Q1: Try to Construct the crystallization scenario in the binary albite-anorthite system at low pressure interpreting the occurrence of the following phenomenon's:

- a)- Occurrence of more acidic plagioclase (albitic) in some tonalite intrusions
- b)- Presence of chemical zoning in plagioclase of volcanic rocks

Write your answers in the same sheets

اكتب أجابته في نفس ورق الأسئلة

Q2- Select or write the correct answer for the following : (1- 5, one mark for each)

1-Comets are composed of:

- A. calcareous bodies
- B. silicate bodies
- C. gas and ice
- D. Carbonates

2-Mention five elements of the Rare Earth Elements (REE)

3- Which one of the following is NOT typical of "siderophile elements?"

- A. They are PGE
- B- They are sulfates
- C- They are noble metals

4-In the Earth's crust, the following elements are usually trace elements:

- A. SiO_2 , Al_2O_3 , MgO
- B. TiO_2 , MnO , P_2O_5
- C. ZnO , NiO , CuO

5-Trace elements are normally classified either on:

- A. The basis of their position in the periodic table
- B. according to their behavior in magmatic system.
- C. Non of above
- D. Both of A. and B.

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6. The term mortar refers to a mixture of:
 - a) sand and gravel, b) silica and feldspar, c) quicklime with sand and water
7. Soil fertility in areas inhabited by humans is in uninhabited areas.
 - a) higher than, b) lower than, c) equal to
8. Prehistoric archaeological sites are defined as those existing:
 - a) before written history, b) after written history.
9. Examples of prehistoric artifacts:
 - a) grinding equipment, b) natural polishing pebbles, c) axes and celts, d) all of the above
10. The favored site for urban civilizations is located:
 - a) close to the sea, b) along and within the floodplains of major river systems, c) in the desert areas
11. A type of chemical sedimentary rock formed by the precipitation of silica from seawater and recorded in many prehistoric sites is:
 - a) chert, b) sandstone, c) quartzite
12. Pottery is the general term for artifacts made mostly of:
 - a) limestone, b) clay, c) granite.
13. The building stone should be
 - a) Soft, b) derived from metamorphic processes. c) light-colored, d) hard, strong, and durable.
14. The earliest metal tool was manufactured around 6000 B.C.
 - a) copper, b) lead, c) zinc, aluminum
15. Metal workers learned how to alloy the metals.
 - a) By 3000 B.C., b) By 4000 B.C., c) By 5000 B.C.
16. Plaster of Paris is produced by heating which rehydrates in the presence of water.
 - a) gypsum, b) silica, c) anhydrite
17. Artifacts are usually discovered
 - a) on the surface, b) buried underground
18. The stones used as finely dressed blocks, slabs, or columns in monumental and costly buildings included:
 - a) limestone, b) granite and marble, c) sandstone
19. The main building stones used in ancient Egypt included
 - a) gabbro, b) diorite, c) limestone and sandstone
20. The primary raw material used in archeological ceramics is
 - a) clay-rich sediments, b) gypsum, c) quartz, d) granite

ملحوظة الامتحان في صفتين

I. Answer three questions only of the following (30M)

Q1 (12.5 M)

Provide brief explanations on the following topics:

- i- The seasoning process of stones.
- ii- The significance of artifacts.
- iii- The use of basalt in temples of the Old Kingdom

Q2 (12.5 M)

- i- Describe the different techniques used to determine the provenance of artifacts.
- ii- Write on the geoarchaeological site exploration.

Q3 (12.5 M)

- i- Examine the connection between geomorphological and geoarchaeological investigations, with a brief case study.
- ii- Discuss the geological materials employed as paints and pigments in the art of Ancient Egypt.

Q4 (12.5 M)

- i- Explain the factors governing the choice of building stone with emphasis on the characteristics and qualities of good building stone.
- ii- Write briefly on the Gebel el-Silsila sandstone quarry (Middle to New Kingdom, Ptolemaic to Roman) and its products.

Q5 (12.5 M)

- i. Examine soil phosphate mapping as a widely used chemical technique in archaeological site prospecting.
- ii. Provide examples of minerals in the archaeological record and discuss their applications.

II. Choose the correct answer (one mark for each):

1. The world's oldest surviving geological map is dated:
a) 1150 B.C., b) 2150 B.C., c) 3150 B.C.,
2. The red ocher has been used for decorative purposes since the Mousterian tradition, which is made up of
a) ilmenite, b) magnetite, c) limonite, d) hematite
3. Provenance of artifacts determined by techniques such as
a) mineralogy, b) petrography, c) trace elements, d) stable isotopes, e) all of them
4. The orientation of the Turin Papyrus Map is
a) east to west, b) south to north, c) northwest to southeast, d) north to south
5. The scientific study of past cultures and the way people lived based on the things they left behind is
a) archaeology, b) geoarchaeology, c) archaeometry

PART TWO

HYDROGEOLOGY

May 2025

25 Marks

Answer the following:

A) Define the following terms:

(10 Marks)

1. Groundwater Aquifer
2. Hydrogeological Unit
3. Storage Coefficient
4. Hydraulic Conductivity
5. Transmissivity Coefficient
6. Specific Retention
7. Hydroscopic Coefficient
8. Wilting Point
9. An Aquiclude Material
10. Moisture Equivalent

B) Write in details on THREE ONLY of the following topics:

(15 Marks)

1. The vertical distribution of the groundwater.
2. Ground water aquifers (their types and characters).
3. Nile Valley and Delta aquifer system.
4. Darcy's law (assumptions and validity).

GOOD LUCK

Prof. Dr. / Abdelhay Aly Farrag

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- 5- Vitritine kerogen which originated from fibrous and woody plants generally produces

II- Choose the correct answer and comment on your choice of the following: - (9 Marks, 1.5 mark each)

- 5- One of the recent hydrocarbons producing provinces in Egypt is
a- Nile Delta b- Komombo Basin c- Northern Western Desert

iii- What are the differences with illustration between the following. -
(6 marks, 1.5 mark each)

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Assiut University
Faculty of Science
Department of Geology



Date: May 2025
Time allowed: 60 minutes

Final Exam

Subject: Petroleum Geology and Hydrogeology (G460)

4th level (all groups)

Total 50 Marks

Part I: Petroleum Geology (25 Marks)

Transfer the questions to your notebook and answer the following: -

I- Complete the following: - (10 Marks)

A- Complete the following: - (5 Marks, one mark each)

- 1- Requirements for high organic productivity include..... and
- 2- The shale source rock that contains TOC range: 1-2 wt% called
- 3- Kerogen maturation depends on and
- 4- The Province is an extensional rift comprising a northwest trending marine basin.
- 5- Oil shale is

B- Complete the following: - (5 Marks, one marks each)

1- Mention the petroleum system elements with illustration: -

- a-
- b-
- c-
- d-

2- Mention the main diagenetic processes possibly reduce porosity of sandstone reservoirs.

- a-
- b-
- c-

3- In northern Western Desert oil fields, the main productive structural traps are called Where series of NE-SW directing folds were found.

4- During reservoir production, hydrocarbons can be produced by

- E) When rock types change laterally within chronostratigraphic units; reflects spatial changes in depositional setting.
1- Interfinger 2- Intertongue 3- Both of them 4- none of them
- F) Which sedimentary contacts refer mostly to conformable relationship between two rock units?
1- Intercalation 2- Gradational 3- both of them 4- none of them
- G) Eocene and Miocene rocks are similar in containing Ore.
1- gypsum 2- iron 3- sulfur 4- none of these
- H) Which of the formations are not belonging to the Nile Delta?
1- Abu Madi 2- Nukhul 3- Sidi Salim 4- Qawasim
- I) The Cretaceous and Eocene sedimentary rocks at Bahariya Oasis are differing in
1- economic important 2- scientific important
3- both of them 4- none of them
- J) The correct stratigraphic order of the Miocene rock units at Wadi Syitain is.....
1- Ranga, Umm Mahara, Abu Dabbab 2- Dakhla, Tarawan, Esna
3- Qusier, Duwi, Dakhla 4- Sameh, Gaber, Shagra
- 5) A) Compare and correlate in a geologic time table the Early (Lower) Cretaceous rock units at both the Sinai and south of Western Desert regions and write the important of each one if present.
(7 Marks)
- B) Write on only one of the following: (3 Marks)
i- Compare in a stratigraphic table the Campanian-Maastrichtian (Upper Cretaceous) rock units at Sinai and Duwi (Red Sea) regions.
ii- Discriminate between the Cenomanian rock units at Sinai and Bahariya Oasis.

انتهت الأسئلة مع أطيب الأمنيات بالتوفيق

أ.د/ ناجح عبدالرحمن عبدالله

أ.د/ علي عبدالقادر خضير

بسم الله الرحمن الرحيم

جامعة أسيوط
كلية العلوم - قسم الجيولوجيا

امتحان المستوى الرابع بكلية العلوم شعبة الجيولوجيا والجيولوجيا

المادة: (جيولوجيا مصر، 415 ج) - (Geology of Egypt, 415 G) الزمن: ستعطين
الدرجة: 50 درجة الفصل الدراسي الثاني 2024/2025

الامتحان يتكون من صفتين

Final Examination (50 Marks)

Answer the following questions using drawings when possible:

- 1) Write briefly on the ideal lithologic sequence of the ophiolites occurring in the Eastern Desert of Egypt and mention the main compositional features of their occurrences. (10 Marks)
- 2) Discuss in detail the main metamorphic types affecting the Egyptian basement. (10 Marks)
- 3) A) Write brief notes on the following terms: (5 Marks)
 - i) Granite classifications in Egypt.
 - ii) Melange types in the Eastern Desert of Egypt.
 - iii) Foreland and Hammamat sediments in Egypt.B) Write the geologic age of the following rock units (formations) and discuss the stratigraphic relationship between every two formations. (5 Marks)

i- Wadi Malik/Desouky	ii- Khattatba/Massajid	iii- Abu Roash/El Heiz
iv- Allam El Buieb /Kharita	v- Khoman/Kiseiba	
- 4) Shade the correct answer 1, 2, 3, or 4 (10 Marks, 1 mark each)
 - A) One of these is not type of the physical stratigraphy.

1- Sequence stratigraphy	2- Lithostratigraphy
3- Magnitostatigraphy	4- Biostratigraphy
 - B) Dungul nd Drunka formations are similar in

1- geologic age	2- economic important	3- both of them	4- none of them
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 - C) Put the following divisions of the Geologic Time Scale in order from oldest to youngest:

1- Sillurian, Carboniferous, Cretaceous, Neogene
2- Sillurian, Ordovician, Triassic, Jurassic
3- Ordovician, Devonian, Carboniferous, Triassic
4- Pliocene, Eocene, Oligocene, Miocene
 - D) What process is responsible for building successive rock layers on Earth?

1- Erosion	2- Faulting	3- Folding	4- Deposition
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- 20- Gradual methods produce surfaces with a stepped appearance.
- 21- Isolines or contours are used to define a common characteristic along a point
- 22- Lines to point interpolation are the most frequently performed type of spatial interpolation done in GIS. e.g. Precipitation and rainfall data
- 23- Approximate interpolators are used when there is some certainty about the given surface values
- 24- The idea of geostatistics is that the points which are close to each other in space should be likely close in values.
- 25- In kurtosis, a value greater than 0 indicates a peaked distribution and a value less than 0 indicates a flat distribution.
- 26- Before formal analysis the data should be examined by displaying as histograms and Plotting.
- 27- In the random sample, selection of an object does not affect the selection of another object (independence of sampling).
- 28- Regression measures the variability (volatility) from an average or mean.
- 29- A variable that cannot assume a numerical value but can be classified into two or more nonnumeric categories is called qualitative variable.
- 30- A population consists of all elements, individuals, items, or objects whose characteristics are being studied.
- 31- Member is a specific subject or object about which information is collected.
- 32- Interpolation predicts values for cells in a raster from a limited number of sample data points.
- 33- Descriptive statistics consists of methods that use the sample results to help make decisions or predictions about a population.
- 34- A data set is a collection of observations on one or more variables.
- 35- Central Tendency is a single summary measure for one variable.
- 36- The selection of interpolation methods decide the quality, accuracy and follow-up analysis applications.
- 37- Unknown values are predicted with a theoretical formula that uses the values of nearby known points.
- 38- Cliffs and fault lines are not well presented because of the smoothing effect in case of spline interpolation.
- 39- Natural neighbor interpolation has many positive features, can be used for both interpolation and extrapolation, and generally works well with clustered scatter points.
- 40- Output data structure is usually in the form of images.
- 41- The less spread apart the data, the higher the deviation.
- 42- A change in an input value only affects the result within the window in case of local interpolation methods.
- 43- Exact interpolators honor the data points upon which the interpolation is based the surface passes through some points whose values are known.
- 44- In planning a study, one often needs to estimate a minimum sample size to obtain a certain precision
- 45- The Inverse Distance Weighting (IDW) assumes the variable being mapped increases in influence with distance from its sampled location.
- 46- A surface created with Spline interpolation passes through each sample point and may exceed the value range of the sample point set
- 47- Measures of dispersion or variability is one of types of description statistics.
- 48- Minimum Curvature is widely used in the earth sciences.
- 49- In any natural spatial distribution, it is almost impossible that the observations at each location are independent.
- 50- If mean is less than median, the data are negatively skewed.



**Final Exam of Statistical Methods
in Geophysics (G456)
(50 mark)**

2025

Time: 2 Hours

Answer the following Questions

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

- 1- The coefficient of variation is the standard deviation divided by the mean.
- 2- The difference between classical statistics and geostatistics is that geostatistics uses the sampling location of every measurement.
- 3- Groundwater contaminant cleanup is one of applications of geostatistics to environmental problems.
- 4- Theoretical statistics deals with the development, derivation, and proof of statistical theorems, formulas, rules and laws.
- 5- Applied statistics involves the applications of those theorems, formulas, rules and laws to solve real-world problems.
- 6- Contour and grid methods are considered only to be functional surface representation.
- 7- The technique of collecting information from a portion of the population is called a sample census.
- 8- The spline method is best for gently varying surfaces, such as elevation, water table heights, or pollution concentrations.
- 9- The Inverse Distance Weighting interpolator assumes that each input point has a local influence that diminishes with distance.
- 10- In any natural spatial distribution, it is almost possible that the observations at each location are independent.
- 11- Geostatistics is used for simulation.
- 12- When the sample points are close together and have extreme differences in value, Spline interpolation doesn't work as well.
- 13- The coefficient of variation is a dimensionless measure of variation.
- 14- A variable that can be measured numerically is called quantitative variable such as Stratigraphic Unit and geologic age.
- 15- Interpolation is used because field data are expensive to collect and can't be collected everywhere.
- 16- The assumption that makes interpolation a viable option is that spatially distributed objects are spatially correlated.
- 17- Data collected on the same element for the same variable at different points in time or for different periods called time series data.
- 18- Covariance provides a measure of the strength of the correlation between two sets of random variates.
- 19- Abrupt methods produce a smooth surface between sample points.

Final Exam. In Radiometric & Geothermal Course (G452)
for Fourth year Students (Geophysics Group)

May, 2025

(50 marks)

Time: 2 hours

- 1- Define the following : (8 marks)
Heat flow - Half-life - Curie - Element - Roentgen - Beta particle -
Isotopes - Thermal distribution
- 2- Complete SIX ONLY of the Following : (13 marks)
 - 1- The quantity of thermal energy that the earth is losing
 - 2- The Continental crust is and has higher
 - 3- The greater the depth the greatest of and the lowest.....
 - 4- The Oceanic crust isand has lower
 - 5- The temperature increases with depth.....
 - 6- Rubidium has two half-life times ,
 - 7- Thermal conductivity controlled by ,
- 3- Write on THREE ONLY of the following : (21 marks)
 - 1- Thermal measurements have provided regional and local information
 - 2- The importance of studying the radioactivity of rocks and minerals
 - 3- Equality of Continental and Oceanic heat flow
 - 4- Geologic Events dated by Radiometric method
- 4- Complete SIX ONLY of the following : (8 marks)
 - 1- The C14 method has used for dating.....
 - 2- Alpha particle is
 - 3- Argon produced by the decay of
 - 4- Radiation is energy in the form of travel from
 - 5- Potassium is a common
 - 6- Zircon is the most common mineral used for
 - 7- Tritium has half- life of aboutyears

=====Good Luck=====

Dr. Mohamed Fekry Khalil

5. Geophysical well logs can provide information about all the following EXCEPT:
- A. Lithology
 - B. Formation fluid content
 - C. Formation pressures
 - D. Surface weather conditions
6. Which of the following logs is used to measure the natural gamma radiation emitted by the formation?
- A. Resistivity log
 - B. Sonic log
 - C. Gamma-ray log
 - D. Neutron log
7. Which open-hole log is designed to measure the time it takes for sound waves to travel through the formation?
- A. Density log
 - B. Caliper log
 - C. Sonic log
 - D. Gamma-ray log
8. Which of the following formations would typically show high resistivity readings?
- A. Sandstone with high water content
 - B. Shale with high clay content
 - C. Limestone with low water saturation
 - D. Coal with high moisture content
9. Which radioactive elements are commonly identified using spectral gamma ray logs?
- A. Potassium (K), Thorium (Th), and Uranium (U)
 - B. Calcium (Ca), Sodium (Na), and Magnesium (Mg)
 - C. Iron (Fe), Manganese (Mn), and Zinc (Zn)
 - D. Carbon (C), Nitrogen (N), and Oxygen (O)
10. What does a high SP reading typically indicate?
- A. Low formation permeability
 - B. High formation salinity
 - C. Presence of hydrocarbons
 - D. High formation permeability
11. In what type of formation is a neutron porosity log most likely to produce misleading results?
- A. Sandy formation with low clay content
 - B. Limestone formation with high clay content
 - C. Shale formation with high water content
 - D. Gas-bearing formation
12. What does a neutron porosity log measure?
- A. The density of the formation
 - B. The hydrogen content of the formation
 - C. The electrical resistivity of the formation
 - D. The gamma radiation from the formation
13. What does a spectral gamma ray log measure?
- A. The total natural radioactivity of the formation
 - B. The spectral distribution of gamma rays emitted by different radioactive elements
 - C. The temperature of the formation
 - D. The formation's resistivity
14. What common feature do neutron and density porosity logs share that aids in their interpretation?
- A. Both measure formation resistivity
 - B. Both are sensitive to formation fluid types
 - C. Both are affected by the presence of gas
 - D. Both measure acoustic wave travel time
15. Which factor is most likely to increase the resistivity of a formation?
- A. High salinity of formation water
 - B. High clay content
 - C. High hydrocarbon saturation
 - D. High water content

Good Luck,,,

Assoc. Prof. Rashad Sawires



2024/2025 Second Semester, Final Examination

1 June 2025	On: Petrophysics and Well Logging (G-459)	Time: 2 hours
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Answer ONLY the required questions, illustrating your answer by suitable SKETCHES wherever possible:

First Question: Write short notes on ONLY FOUR of the following: (20 marks)

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

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

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

Third Question: Choose the correct answer: (15 marks)

1. Which of the following conditions can a caliper log help identify?
A. High resistivity zones
B. Borehole washouts and enlargements
C. Formation pressure changes
D. Fluid saturation
2. What is a common type of drilling fluid used in oil and gas operations?
A. Hydraulic fluid
B. Water-based mud
C. Diesel fuel
D. Ethanol
3. What does the log tail generally display?
A. The end of the log data
B. Calibration data and final remarks
C. Detailed lithological descriptions
D. Drilling history of the well
4. How does resistivity differ between oil-bearing and water-bearing zones?
A. Oil-bearing zones generally have higher resistivity than water-bearing zones
B. Oil-bearing zones generally have lower resistivity than water-bearing zones
C. Resistivity is the same in both oil-bearing and water-bearing zones
D. Oil-bearing zones have more variable resistivity than water-bearing zones

14. Skarn type deposits are (magmatic, sedimentary, metamorphic, metasomatic) process.

15. A region characterized by a particular assemblage of mineral deposit type is named (metallogenic epoch, metallotectic, metallogenic provinces, metallogeny).

B. Answer SEVEN ONLY of the following (5 pts for each question)

1. Discuss shortly how S-saturation is reached by the fractionation of Fe-bearing minerals such as olivine and pyroxene.
2. Differentiate between the following pairs of terms: (a) ore and mineral deposits; (b) epigenetic and syngenetic deposits; (c) hypogene and supergene hydrothermal solution.
3. Discuss the mineralogical and chemical changes associated with wall-rock alteration.
4. Classify metamorphism-related mineral deposits and describe their major characteristics, citing examples.
5. What are skarn deposits? Describe their characteristics and origin.
6. Write short notes on the following: (a) orogenic gold deposits, (b) sedimentary iron ore, and (c) chromite deposit.
7. What is supergene enrichment? How do supergene enriched deposits differ from lateritic deposits?
8. With the help of drawing illustration, describe how the roll front uranium deposits are formed.

Best Wishes

Mohamed Abdel- Moneim



Ore forming processes (438)

- A. Choose the correct answer for each sentence of the following: (15 pts)
1. Lithophile elements are typically found associated with (basic and ultrabasic, felsic igneous, intermediate igneous, metamorphic) rocks
 2. In the porphyry type deposits Cu, Au, are derived from (mafic mantle, felsic crustal, mixing of crustal and mantle, metamorphic rocks).
 3. The inner zone of the hydrothermal alterations related to porphyry type deposits is represented by (phyllic, potassic, propylitic, chloritization) alteration.
 4. VMS deposits are derived via (magmatic fractionation, fluid immiscibility, hydrothermal solution, metasomatic) process.
 5. The metal zonation of VMS is represented in the inner zone by (pyrite and chalcopryrite, pyrite- sphalerite - galena , sphalerite-galena-pyrite, Fe and Mn oxides) deposit.
 6. Halite is formed by (mechanical placer, chemical sedimentary, supergene, biogenic) process
 7. The main factor controlling the placer deposits is (pressure, temperature, specific gravity, hardness).
 8. Residual mineral deposits produced as a result of (mechanical weathering, chemical weathering, evaporation, supergene enrichment) process
 9. The existing mineral deposits that turned into a more highly concentrated mineral deposits by weathering process is (secondary enrichment, placer deposits, residual, skarn) deposit
 10. Hot aqueous solutions responsible for the formation of many ore deposits are named (magma melts, sea water, hydrothermal solutions, ground water).
 11. Bauxite and laterite are formed due to (residual, placer, metamorphic, supergene enrichment) process.
 12. Pt, Cu—Ni sulphide deposits of Bushveld, South Africa are formed via (fluid immiscibility, magmatic segregation, pegmatitic, metamorphogenic) process.
 13. Li, deposits of Kings Mtn. N.C. is deposited by (pegmatitic, fluid immiscibility, magmatic fractionation, metasomatic) process.

27) Which cipher type is typically faster in processing data

a) Block cipher	c) Both are equally fast
b) Stream cipher	d) Neither is fast

28) What is the main difference between symmetric and asymmetric encryption

a) Symmetric encryption uses two keys, while asymmetric uses one	c) Asymmetric encryption is used for data integrity, while symmetric is not
b) Symmetric encryption is faster than asymmetric encryption	d) Symmetric encryption is used for digital signatures, while asymmetric is not

29) Which of the following is an example of a public key encryption algorithm

a) DES	c) AES
b) RSA	d) Blowfish

30) What is the primary function of encryption in cryptography

a) To compress data for storage	c) To convert plaintext into ciphertext
b) To verify the integrity of data	d) To generate random numbers

Q2. Encrypt the word Hello using Playfair cipher algorithm with key Playfair (5 Marks)

18) In the context of steganography, why is it beneficial to use a larger host image

a) It allows for more data to be hidden without noticeable distortion.	c) It reduces the need for encryption.
b) It simplifies the encoding process.	d) It eliminates the need for a secret message.

19) What does a higher PSNR value indicate in image processing

a) Lower image quality	c) Higher image quality
b) Increased file size	d) More compression artifacts

20) Which is a corrective countermeasure that helps after an attack detected

a) Disabling the affected user accounts	c) Installing a firewall
b) Encrypting sensitive data	d) All of the above

21) What is the primary purpose of padding in block cipher methods

a) To increase the encryption speed	c) To ensure that the plaintext is a multiple of the block size
b) To reduce the size of the ciphertext	d) No correct answer

22) Which of the following is NOT a passive attack

a) Meet-in-the-Middle attack	c) Eavesdropping on a conversation
b) Traffic analysis	d) None of the above

23) Which of the following activities would be classified as a passive attack

a) Sending phishing emails	c) Capturing and analyzing unencrypted data packets
b) Exploiting a vulnerability in software	d) Launching a brute-force attack on a password

24) What is the size of the key matrix used in the Playfair cipher

a) 4x4	c) 5x5
b) 6x6	d) 3x3

25) Which of the following is a common medium used for steganography

a) Text files	c) Images
b) Audio files	d) All of the above

26) What is the primary method of encryption used by block ciphers

a) Encrypts data one bit at a time	c) Encrypts data using variable sizes
b) Encrypts data in fixed-size blocks	d) No correct answer

9) False nonmatch rate in high-security application must be

a) According to problem	c) High rate
b) Low rate	d) Reasonable rate

10) What effect does adding salting have on the time necessary to crack a password

a) No impact on time	c) Makes the password impossible to crack
b) Increases the time needed for cracking	d) Speeds up the cracking process

11) What does the encryption process in a stream cipher generally involve

a) Encrypting data in fixed-size blocks	c) Using a public key for encryption
b) Applying a hash function to the data	d) Combining plaintext with a key stream bit by bit

12) What is the primary benefit of using multi-factor authentication (MFA)

a) It enhances security by requiring multiple forms of verification	c) It simplifies the login process
b) It eliminates the need for passwords	d) It is faster than single-factor authentication

13) Which of the following is an example of "something the user is" in authentication

a) A password	c) A security question
b) A fingerprint or facial recognition	d) A hardware token

14) What is the role of firewalls in defending against active attacks

a) To monitor user behavior	c) To provide user authentication
b) To encrypt data	d) To filter network traffic

15) Why are regular software updates important in security

a) They improve system performance	c) They add new features
b) They patch vulnerabilities	d) They reduce the need for passwords

16) Which of the following features is commonly found in email scanning software

a) User authentication	c) Malware detection
b) Network performance monitoring	d) Data backup

17) What is a potential drawback of not implementing a "Security in Depth" strategy

a) Increased complexity in security management.	c) Higher costs for security solutions.
b) Greater vulnerability to attacks if a single layer is breached.	d) Improved user experience.



Cryptography
Code: ك ٤٦٦
50 Marks

date: 30/5 /2025
Time: 2 Hour



Q1. Choose the right answer:

45 Marks

1) What type of cipher is RC4.

a) Block cipher	c) Hash function
b) Stream cipher	d) Asymmetric cipher

2) In RC4, what is the purpose of the key-scheduling algorithm (KSA)

a) To generate the initial permutation of the state array	c) To encrypt the plaintext
b) To produce the final ciphertext	d) To decrypt the ciphertext

3) What is the size of the state array used in RC4

a) 128 bytes	c) 56 bytes
b) 512 bytes	d) 256 bytes

4) What does "integrity" in the context of computer security mean

a) Protecting data from unauthorized modification	c) Ensuring that data is available when needed
b) Keeping data confidential	d) Ensuring that systems are user-friendly

5) Which of the following techniques is used to maintain data integrity

a) Hashing	c) Data encryption
b) Firewalls	d) User authentication

6) What does "availability" in computer security refer to

a) Ensuring that data is kept secret	c) Ensuring that data is accurate and reliable
b) Ensuring that systems and data are accessible when needed	d) Protecting data from unauthorized access

7) Which of the following can threaten the availability of a system

a) Denial of Service (DoS) attacks	c) Data breaches
b) authorized access	d) Data corruption

8) Which of the following best describes the relationship between confidentiality, integrity, and availability)

a) They are independent of each other.	c) They are interdependent and collectively ensure security.
b) They are mutually exclusive.	d) They are only relevant in specific contexts.