

UNIVERSITY OF BALOCHISTAN QUETTA
MA/MSC (ANNUAL) EXAMINATION 2015.

- Attention:-
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Subject:- GEOLOGY Paper:- I (Prev)

TIME ALLOWED: 3 HOURS Tectonics & Structural Geology. MAX: MARKS: 15+60=75

NOTE:- Attempt any five Questions, but Question No 1 is compulsory and time for it is only 40 minutes after expiry of time paper should be handed over to the examiner.

SECTION I

ATTEMPT ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

- I Define Structural Geology.
- ii What is box fold?
- iii What is convectional current?
- iv what is asthenosphere?
- V Differentiate between continental and oceanic crust.
- Vi What is hinge of fold?
- Vii Define isoclinal fold.
- Viii Differentiate between rotational and compressional moment.
- ix What is normal fault?
- X Define foot wall.
- Xi what is plunging fold?
- Xii What is thrust fault?
- Xiii Define dip of fault.
- Xiv What is hanging wall?
- Xv Define strike of fault.

SECTION:- II [MARKS:- 60 TIME ALLOWED:- 2:20]

ATTEMPT ANY FOUR QUESTIONS FROM SECTION II. ILLUSTRATE YOUR ANSWERS BY LABEL DIAGRAMS.

- Q: 2 What is unconformity? Describe different types of unconformities.
- Q:3 Define fold, briefly describe the geometrical classification of fold.
- Q:4 Define lineation, describe the classification of lineation.
- Q:5 Differentiate between fault and joint, briefly describe the classification of joint.
- Q:6 What do you understand by term foliation give brief account of classification of foliation.
- Q:7 Precisely describe mechanics of folding and define flexure folding, flow folding and shear folding.
- Q:8 Define fault, describe the geometrical classification of fault.
- Q:9 Write short notes on the following.
 - a) Stress and Strain.
 - b) Fault and joint.
 - c) Convergent and Divergent plate boundaries.

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Subject:-

GEOLOGY.

Paper:- II (Prev:)

Time Allowed :- 3 Hours

Paper; II (Sedimentology)

Max : Marks : 75

Note :- Attempt 05 Questions. in All But Question No. 1- in section -I is compulsory and the time for Section I is only 40 Minutes. After Expiry of the Time paper should be handed over to the supervisory staff.

SECTION -I (OBJECTIVE PORTION 15 MARKS)

- Q.1 **Define any fifteen from the following** 15
- i. Well sorted sandstone
 - ii. well rounded grain
 - iii. Mode
 - iv. Fabric
 - v. Primary sedimentary structure
 - vi. Flute marks
 - vii. Ripple marks
 - viii. Cross stratification
 - ix. Detrital sedimentary rock
 - x. Conglomerate
 - xi. Chert
 - xii. Secondary Porosity
 - xiii. Allochem
 - xiv. Framework grains
 - xv. Micrite
 - xvi. Diagenesis
 - xvii. Facies
 - xviii. Imbrication
 - xix. Lagoon
 - xx.

SECTION -II (SUBJECTIVE PORTION 60- MARKS) TIME ALLOWED 2:20

Attempt any Four (04) questions.

- Q.2 **Attempt any four questions from this section**
Describe various ways of graphical presentation of grain size data. 15
- Q.3 What is bedform? Describe various types of bedform. 15
- Q.4 Describe the classification of sandstone. 15
- Q.5 What is the difference between folk's and Dunham classification of limestone? Give strength and weaknesses of each. 15
- Q.6 Describe Meandering Stream Deposits 15
- Q.7 Describe diagnostic features of the Deltaic Deposits 15
- Q.8 Describe various processes that transport sediment from continental shelf to abyssal plain. 15
- Q.9 Describe the factors that control Provenance of the sandstone. 15

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Subject:- **GEOLOGY** Paper:- III (Prev)
Time Allowed :- 3 Hours **ECONOMIC AND FIELD GEOLOGY** Max : Marks : 75

Note :- Attempt 5 Questions in All But Question No. 1- in section -I is compulsory and the time for Section- I is only 40 Minutes. After Expiry of the Time paper should be handed over to the supervisory staff.

SECTION -I (OBJECTIVE PORTION 15 MARKS)

Note Attempt any 15 questions out of 20, all questions carry equal marks.

Q.No.1. Answer the following questions briefly and to the point, no details are required.

1. Define Field Geology.
2. Sedimentary rocks are divided into how many categories. ?
3. What is a base map?
4. The grainular rock in largest size is called what?
5. Agglomerate is which type of rock?
6. How are clastic rocks formed?
7. What is a odometer?
8. What is the use geologic hammer?
9. What is correlation?
10. What is shaft?
11. Write the names of economic minerals of Balochistan.
12. Define mesothermal deposits.
13. What type of coal deposits formed in Pakistan?
14. Copper is formed by which process?
15. Define the biofacies maps.
16. What is the use of limestone?
17. Define a gangue.
18. What is ore?
19. Write the names cementing materials.
20. How the clastic rocks formed?

SECTION -II(SUBJECTIVE PORTION 60- MARKS) TIME ALLOWED 2:20

Attempt any Four (04) questions.

- Q .1. Write a detail not on Brunton compass.
- Q .2 Write note on topographic and geological map.
- Q .3 Describe the field relations of sedimentary rocks.
- Q .4 Write the methods of subsurface geological mapping:
Section 11.
- Q .5 Briefly describe any three of, 1 copper. 2 gold.3 salt.4 clays..
- Q .6 Write in detail on clays, building stones and radioactive minerals.
- Q .7 write a detail note on economic minerals of Chagai.
- Q .8 What are Gemstones ? write detail note on coal deposits of Balochistan.

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Subject:-

GEOLOGY.

Paper:- IV(Prev:)

Time Allowed :- 3 Hours

MINERALOGY

Max : Marks : 75

Note :- Attempt Five Questions. in All But Question No. 1- in section -I is compulsory and the time for Section- I is only 40 Minutes. After Expiry of the Time paper should be handed over to the supervisory staff.

SECTION -I (OBJECTIVE PORTION 15 MARKS)

Q.No.1 Q.1

ATTEMPT ANY FIFTEEN PARTS

- i. What is mineral?
- ii Define atomic structure
- iii What is ionic radii
- iv What is metallic bond?
- v Define crystal chemistry
- vi What is crystal habit?
- vii What is a crystal form?
- viii What is space lattice?
- ix What is unit cell?
- x What is valency?
- xi Define Isotope
- xii Define specific gravity
- xiii What is covalent bond?
- xiv What is the difference between oxidation and reduction?
- xv What is the difference between liquidus and solidus curves?
- xvi Define paragenesis
- xvii What is difference between opaque and non-opaque mineral?
- xviii What is paleochrism?
- xix What is the difference between physical and optical properties of a mineral?
- xx What is extinction?

SECTION -II(SUBJECTIVE PORTION 60- MARKS) TIME ALLOWED 2:20

Attempt any Four (04) questions.

- Q.2 Describe chemical classification of minerals
- Q.3 Highlight the role of ionic bond in the formation of mineral. Give examples
- Q.4 What is Phase Rule? Explain Albite-Anorthite system.
- Q.5 How would you differentiate between Hornblende and Biotite under microscope?
- Q.6 Describe the application of Universal stage in the identification of minerals
- Q.7 What is X-Ray diffractometry and how it is used to identify mineral
- Q.8 Describe classification of silicate minerals. Give example from each group.
- Q.9 Write short notes on any two of the following
 - (a) Uniaxial indicatrix
 - (b) Polymorphism
 - (c) Nicol Prism

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Subject:- **GEOLOGY .** Paper:- V (Prev:)
Time Allowed :- 3 Hours **IGNEOUS AND METAMORPHIC PETROLOGY** Max : Marks : 75

Note :- Attempt Five Questions. in All But Question No. 1- in section –I is compulsory and the time for Section- I is only 40 Minutes. After Expiry of the Time paper should be handed over to the supervisory staff.

SECTION –I (OBJECTIVE PORTION 15 MARKS)

Q.No.1 Define the following terms precisely no details are needed. Attempt any fifteen(15)

- i. Granite
- ii. Granodiorite
- iii. Syenite
- iv. Carbontite
- v. Mafic
- vi. Basalt
- vii. Andesite
- viii. Rhgolite
- ix. Dacite
- x. Metamorphism
- xi. Grade
- xii. Zones of Saturation
- xiii. Facies
- xiv. Metamorphic Facies
- xv. Metamorphic texture
- xvi. Differentiation
- xvii. Structure.
- xviii. Argillaceous .
- xix. Biolith .
- xx. ACF diagram .

SECTION –II(SUBJECTIVE PORTION 60- MARKS) TIME ALLOWED 2:20
Attempt any Four (04) questions.

- Q.2. Write a brief note on composition and origin of “Magma”
- Q.3 Briefly describe classification of “Igneous Rocks”
- Q.4. Give an account of “Metamorphic Rocks”
- Q.5. Define “Metamorphism” describe classification of metamorphic rocks with different examples .
- Q.6. Distinguish between mafic and ultramafic Rocks .
- Q.7. Diagrammatically Illustrate the ACF and AKF petro logical processes .
- Q.8. Differentiate between thermal and regional Metamorphism.
- Q.9. Give a brief account on “Porphyritic” and “Intergrowth” texture of indigenous rocks .
- Q.10. Write short notes on:-
a) Granularity .
b) Crystallinity .
c) Shape of Crystals .

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Subject:-

GEOLOGY.

Paper:- VI(Prev:)

Time Allowed :- 3 Hours

Micro Paleontology & Biostratigraphy

Max : Marks : 75

Note :- Attempt Five Questions. in All But Question No. 1- in section –I is compulsory and the time for Section- I is only 40 Minutes. After Expiry of the Time paper should be handed over to the supervisory staff.

SECTION –I (OBJECTIVE PORTION 15 MARKS)

Q.1. Define the following terms precisely no details are needed . (Attempt any 15)

- I. Fossil .
- II. Horizon
- III. Calcih
- IV. Cone of depression
- V. Convection cell .
- VI. Algae
- VII. Pollen
- VIII. Organic Wall.
- IX. Micro plankton .
- X. DRM
- XI. CCM
- XII. TRM
- XIII. DD
- XIV. Terrace
- XV. Tuff.
- XVI. Tidal inlet
- XVII. Trap rock
- XVIII. Atoll
- XIX. Index Fossil
- XX. Nanno – Fossil

SECTION –II(SUBJECTIVE PORTION (60 Marks) TIME ALLOWED 2:20

- Q.2. Give a brief account on “Principles of bio-Stratigraphy”
- Q.3. Write a detail note on uses or application of Microfossils .
- Q.4. Define “Paleontology” describe tertiary bio stratigraphy with special reference to Pakistan .
- Q.5. Discuss Ecology of the “Plaktaon Foraminifera”
- Q.6. Diagrammatically Illustrate General characteristics of “Foraminifera”
- Q.7. Write at least ten main points Indicating bio stratigraphic Techniques and procedures .
- Q.8. Define “bio stratigraphy” describe on importance of “Biostratigraphy”
- Q.9. Write a comprehensive note on bio” Stratigraphic Zones”
- Q.10. Write short notes on :-
 - a) Bar type Condonts .
 - b) Dis coaster .

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Subject: GEOLOGY; Geophysics and Geomorphology; PAPER VII (Previous)

Time Allowed: - 3 Hours.

Max: Marks: 75

Note: Attempt any Five Questions in All But Question No.1 in Section -1 is compulsory and the time for Section -1 is only 40 Minutes. After Expiry of the Time paper should be handed over to the supervisory Staff

Section -1(15-Marks)

Q.1. Attempt 15 questions. All questions carry equal marks.

1. Dunes.
2. Glacial deposits.
3. Discontinuous Permafrost.
4. Aquifer.
5. Sporadic permafrost.
6. Frost
7. Slope.
8. Permanent streams.
9. Glaciers
10. Desert.
11. Formula for stream flow and channel shape.
12. Stream ordering.
13. Hydrolysis
14. Exfoliation.
15. Rayleigh Waves.
16. Geophones
17. Geothermy.
18. Drainage density (DD)
19. Meander.
20. Dendritic Drainage Pattern.

Section-2 marks 60 time allowed 2:20 hours.

Note: Attempt any Two Questions from each part. All questions carry equal marks.

Part-I (Geomorphology)

Q.6. Define Drainage Pattern, discuss different types of Drainage patterns in detail.

Q.7. Determine bifurcation Ratio (Rb) for the given Stream ordering values:

Stream of First Order = 65.

Stream of Second Order = 35.

Stream of Third Order = 15. And

Stream of Fourth Order = 1.

Q.8. Highlight the main headlines showing "Periglacial and Glacial" Land forms.

Q.9. Briefly describe "Slope processes"

Q.10. Write a notes on any three of the following:

a) Landforms

b) Ground water movement

c) Warm Semi-arid climates.

d) Slope profile

e) Saturation overland flow

Part-II (Geophysics)

Q.2. What is the geological criteria for determining the suitability of a site for a "Dam"? Why is it essential to monitor the seismicity of the region in which a "Dam" is being built?

Q.3. a) Define Paleo-magnetism. Discuss Geomagnetism in detail.

Q.4. Write on "Air bone" Geophysical Techniques used in mineral exploration.

Q.5. What is Seismology? Describe briefly and illustrate your answer with help of diagrams.

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Subject:-

GEOLOGY

Paper:- IX(Final)

Time Allowed :- 3 Hours

GEOLOGY OF PAKISTAN

Max : Marks : 75

Note :- Attempt 05 Questions in All But Question No. 1- in section -I is compulsory and the time for Section-I is only 40 Minutes. After Expiry of the Time paper should be handed over to the supervisory staff.

SECTION -I (OBJECTIVE PORTION 15 MARKS)

Q1. Attempt any 15 questions; each question carries 01 marks. Answer each question in one or two sentences.

1. Kohistan Island Arc is exposed between MMT and MKT. Is it true?
2. A disconformity exists in the Maree Brewery section. Where is it in the stratigraphic succession?
3. We have large reserves of coal in the Balochistan; name the concerned formation and age.
4. Where is accretionary belt exposed in Pakistan?
5. Where are shield rocks exposed in Pakistan?
6. Name the oldest sedimentary rocks of the Pishin Belt.
7. What type of fault is the Ornach-Nal fault?
8. What is a malange?
9. What do you mean by syntaxis? Give an example.
10. What is the age of rock salt deposit in Pakistan?
11. How the mountain belt of Pakistan came into existence?
12. Give any two examples of ophiolites?
13. What is the difference between volcanic arc and island arc?
14. Please give an example of a disconformity in the Salt Range.
15. Please give an example of Island Arc.
16. Please give an example angular unconformity.
17. What is an accretionary belt?
18. How Chagai Magmatic Arc came into existence?
19. Where porphyry copper deposits are found in Pakistan?
20. Which is the oldest sedimentary rock formation of the Salt Range?

SECTION - II: SUBJECTIVE PORTION (MARKS: 60)

Time allowed: 2 hours 20 minutes

Note: Attempt any four questions. All questions carry equal marks.

- Q.1. Briefly describe the Cretaceous stratigraphy around Quetta valley.
- Q.2. Write a note on the Makran subduction complex.
- Q.3. What are ophiolites? Write a note on the Bela Ophiolite.
- Q.4. Describe briefly the Urak Group of the Zarghun Trough.
- Q.5. Briefly discuss stratigraphy of the Pishin belt.
- Q.6. Write short notes on any two of the following:
 - a) Geology of the Spin Karez area
 - b) Maree Brewery section
 - c) Ghazij Formation
- Q.7. Write a note on the geology of the area where you have carried out your geological field work.

8. **Earthquakes may be caused by:**
1. Movement Of Tectonic Plates.
 2. Motion along Faults In Earth's Crust.
 3. All Of These
9. **A subduction zone is most likely to be encountered:**
1. At a convergent plate boundary.
 2. At a divergent plate boundary
 3. At a transform plate boundary
10. **A ridge of sediment, usually sand or gravel, deposited in the middle or along the banks of a stream is called**
1. Bar
 2. Natural Levees
 3. V shape valley

SECTION -II(SUBJECTIVE PORTION 80- MARKS) TIME ALLOWED 2:20
Attempt any Four (04) questions.

- Q No.1 What is Rock? Discuss sedimentary rocks in detail.
- Q No.2 Write a detail note on the cycle of fluvial erosion?
- Q No.3 Describes various methods of Stream erosion and various landforms produced by fluvial erosion?
- Q No. 4. Write a detail note on the internal structure of the Earth?
- Q No.5 "Landforms are the product of structure, process and Time" Critically examine this statement with examples?
- Q No.6 Discuss various geographical factors which favors the development of soil.
- Q No.7 define weathering and discuss weathering as an important geomorphic agent for the development of various landforms. Illustrate your answer with suitable diagrams.

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Subject:-

GEOLOGY .

Paper:- XI (Final)

Time Allowed :- 3 Hours

Petroleum Geology

Max : Marks : 100

Note :- Attempt Five Questions. in All But Question No. 1- in section –I is compulsory and the time for Section- I is only 40 Minutes. After Expiry of the Time paper should be handed over to the supervisory staff.

SECTION –I (OBJECTIVE PORTION 20 MARKS)

Q.No.1 Short Questions (Attempt All)

- i. Define Crude oil
- ii. Why the flow of petroleum is against the gradient
- iii. What is the chemical composition of Sui Gas and name the reservoir rock .
- iv. Which is the oldest oil field of Pakistan .
- v. Name the oldest gas field of upper Indus Basin
- vi. Which rock can be a seal .
- vii. What is a reservoir rock and why it become reservoir .
- viii. Define porosity and permeability
- ix. Define Lithification
- x. Can sandstone be a source rock if yes or not give reasons .
- xi. What are classic and non classic rocks.
- xii. For the reservoir which rocks are more suitable .
- xiii. Give the reason for migration of oil .
- xiv. What is Source rock ?
- xv. Name the reservoir rock of biggest oil field of World .
- xvi. Are the horst and grabens are suitable for the reservoir of the petroleum .
- xvii. Define capillary action
- xviii. Do we need the driving force to the pump the oil .
- xix. Why oil floats on the water .

SECTION –II(SUBJECTIVE PORTION 80- MARKS) TIME ALLOWED 2:20

Attempt any Four (04) questions.

- Q.2. Discuss about the petroleum occurrence of lower Indus Basin
- Q.3. What is migration and discuss its all parameters responsible for petroleum migration .
- Q.4. Define trap and discuss in detail its all types.
- Q.5. Discuss about the petroleum occurrence of Baluchistan .
- Q.6. Explain in detail any three oil fields and gas field of Pakistan .
- Q.7. Discuss about the role of various structure in the field of Petroleum .
- Q.8. Define sequence stratigraphy and its importance with respect to hydro carbon occurrence .
