

GEOLOGY

TIME ALLOWED: THREE HOURS	(PART-I MCQs) MAXIMUM MARKS: 20
PART-I (MCQs) : MAXIMUM 30 MINUTES	(PART-II) MAXIMUM MARKS: 80
NOTE: (i) First attempt PART-I (MCQs) on separate OMR Answer Sheet which shall be taken back after 30 minutes. (ii) Overwriting/cutting of the options/answers will not be given credit. (iii) There is no negative marking. All MCQs must be attempted.	

PART-I (MCQs)(COMPULSORY)

- Q.1. (i) Select the best option/answer and fill in the appropriate Box ☐ on the OMR Answer Sheet.(20x1=20)
(ii) Answers given anywhere else, other than OMR Answer Sheet, will not be considered.

- Kyanite is the polymorph of:
 - Sillimanite
 - Cerussite
 - Siderite
 - None of these
- An intermediate stress acts _____ to the plane containing the largest and smallest stress.
 - Parallel
 - Oblique
 - Normal
 - None of these
- Groove cast, Flute and Tool marks are found on the _____ of the bed.
 - Bottom
 - Top
 - Within bed
 - All of these
- Which mineral is exploited from the Dudar Mine of Lasbela District?
 - Sphalerite
 - Pyrite
 - Galena
 - All of these
- On a thrust fault, the hanging wall moves _____ relative to the foot wall.
 - Horizontal
 - Up
 - Down
 - None of these
- A concordant lens-shaped pluton occupying the crest of an anticline or the bottom of a syncline and being fed by a conduit from beneath is:
 - Laccolith
 - Phacolith
 - Lopolith
 - None of these
- Progradational stacking patterns indicate:
 - Sea-level rise > sediment supply
 - No change in base level
 - Sediment supply > accommodation
 - None of these
- Titanosaurian sauropod and Abelisaurid theropod fossils have been discovered in _____ area of Pakistan.
 - Kirthar Range
 - Pab Range
 - Salt Range
 - All of these
- Which mineral/s exhibit strong uniaxial negative optical character:
 - Zircon
 - Quartz
 - Apatite
 - All of these
- In a geological map, if topographic contours and geological contacts are parallel to each other, then beds are:
 - Vertical
 - Horizontal
 - Inclined
 - Folded
- Following can be used as raw material for the cement.
 - Limestone
 - Hematite
 - Shells
 - All of these
- In stratigraphic classifications, Unconformity bounded strata are classified as _____ unit.
 - Allostratigraphic
 - Biostratigraphic
 - Chronostratigraphic
 - None of these
- For shallow site investigation, the most suitable geophysical method is:
 - Gravity
 - Magnetic
 - Seismic refraction
 - None of these
- Expansive clay soils pose engineering problems mainly due to high:
 - Permeability
 - Shrink-swell potential
 - Density
 - High silica content
- An oil discovery of 2000 barrels with the oil price being 40 \$/bbl. Suppose that \$8000 were spent on this oil field. Therefore, at least _____ barrels are required to break even.
 - 200
 - 100
 - 50
 - None of these
- Material/s with high compressive suitable for construction purpose is/are:
 - Concrete
 - Granite
 - Steel
 - All of these
- The quantity of Calcium (Ca) in a carbonate rock is commonly measured by using _____ technique.
 - Gravimetric
 - Volumetric
 - Flame photometer
 - None of these
- A Lowstand Systems Tract (LST) typically develops during:
 - Rapid relative sea-level rise
 - Maximum transgression
 - Relative sea-level fall
 - Highstand stability
- The most reliable biostratigraphic markers are:
 - Ichnofossils
 - Derived fossils
 - Pseudofossils
 - Index fossils
- In the Cretaceous petroleum system of Lower Indus Basin, _____ Formation serves as seal rock.
 - Upper Goru Shales
 - Ranikot
 - Ghazij
 - None of these

PART-II

- NOTE:** (i) **Part-II** is to be attempted on the separate **Answer Book**.
 (ii) Attempt **ONLY FOUR** questions from **PART-II** by selecting **TWO** questions from **EACH SECTION**. **ALL** questions carry **EQUAL** marks.
 (iii) All the parts (if any) of each Question must be attempted at one place instead of at different places.
 (iv) Write Q. No. in the Answer Book in accordance with Q. No. in the Q.Paper.
 (v) No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.
 (vi) Extra attempt of any question or any part of the question will not be considered.

SECTION-A

- Q. No. 2.** Describe how metamorphic facies are different from metamorphic zones. (20)
 Discuss the role of pressure-temperature (P–T) conditions in defining metamorphic facies and their significance in tectonic settings.
- Q. No. 3.** (a) Discuss the significance of micropaleontology in petroleum exploration and stratigraphic correlation. (10)
 (b) Briefly describe the stratigraphy of Lower Indus Basin. (10) (20)
- Q. No. 4.** Discuss in detail, the major tectonic zones of Pakistan. (20)
- Q. No. 5.** Write comprehensive note on any **FOUR** of the following:- (5 each) (20)
- | | |
|------------------------------|---|
| (i) Scope of Geology | (ii) Optical Properties of Feldspar Group |
| (iii) Modes of Fossilization | (iv) Gemstones of Pakistan |
| (v) Khewra Salt Mine | (vi) Atterberg Limit Tests |

SECTION-B

- Q. No. 6.** Discuss various geophysical techniques used in petroleum, mineral, and water exploration, highlighting their advantages and limitations. (20)
- Q. No. 7.** Define differential entrapment of hydrocarbons. Discuss how migration pathways and timing lead to differential entrapment of oil and gas in a single trap. (20)
- Q. No. 8.** Define geological hazards. Explain the phenomenon of Glacial Lake Outburst Floods (GLOFs) and its increasing risk in Pakistan. (20)
