FEDERAL PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS IN BS-17 UNDER THE FEDERAL GOVERNMENT, 2013

GEOLOGY, PAPER-I

Roll Number

TIME ALLOWED: THREE HOURS	**(PART-I MCQs)**	**30 MINUTES**	**MAXIMUM MARKS: 20**
	(PART-II)	**2 HOURS & 30 MINUTES**	**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.**

PART-I ((MCQs) (COMPULSORY)

Q.1. (i) Select the best option/answer and fill in the appropriate Circle ● on the **OMR Answer Sheet. (20x1=20)**
(ii) Answers given anywhere, other than OMR Answer Sheet, shall not be considered.

1. According to the principle of uniformatarianism:
(a) Geologic processes we observe today have operated in the past
(b) Geologic process in the past operated at the same rate as they do today
(c) All of the planets formed from a uniform solar nebula
(d) Early earth was covered by a uniform magma ocean **(e)** None of these

2. Metamorphic rocks are changed rocks. Which of the following rock types could be the "parent" of a metamorphic rock?
(a) Sedimentary **(b)** Igneous **(c)** Metamorphic **(d)** All of these **(e)** None of these

3. Approximately how fast does an Earth lithospheric plate move?
(a) Several centimetres per year **(b)** Several centimetres per day
(c) Several centimetres per hour **(d)** Several centimetres per second **(e)** None of these

4. Minerals:
(a) Can form by life-processes—organic **(b)** Are crystalline solids **(c)** Have a unique chemical composition
(d) Can be any state (solid, liquid or gas) as long as that state occurs naturally **(e)** None of these

5. Features useful in defining plate boundaries include all except:
(a) Shorelines between continents and oceans **(b)** Distribution of volcanoes
(c) Distribution of earthquakes **(d)** Distribution of mountain ranges **(e)** All are correct

6. The age of the earth is currently thought to be:
(a) About 6,000 years old **(b)** About 6 billion years old **(c)** About 4,500,000 years old
(d) About 4,500,000,000 years old **(e)** None of these

7. Volcanism is associated with which of the following types of plate boundaries?
(a) Convergent plate boundaries **(b)** Divergent plate boundaries **(c)** Transform fault plate boundaries
(d) Divergent and Convergent plate boundaries **(e)** None of these

8. A clastic rock is:
(a) A rock formed from the cementation of transported grains
(b) A rock formed from evaporation of sea water **(c)** Transformed by heat into limestone
(d) Transformed by pressure into limestone **(e)** None of these

9. What is the different between a breccia and a conglomerate:
(a) Breccias are coarse grained and conglomerates are fine grained
(b) Conglomerates are coarse grained and breccias are fine grained
(c) Breccias have rounded fragments and conglomerates have angular fragments
(d) Breccias have angular fragments and conglomerates have rounded fragments **(e)** None of these

10. In regional metamorphism the source of increased temperature and pressure is _____.
(a) A local intrusive heat source **(b)** Impact metamorphism
(c) The increase in temperature with increasing depth of burial
(d) Due to increase rate of radioactive decay **(e)** None of these

11. Which of the following statements about metamorphism of a shale is false?
(a) With increasing metamorphism, the clay minerals breakdown to form micas
(b) With increasing metamorphism, the grain size of the minerals gets smaller
(c) With increasing metamorphism, foliation develops
(d) With increasing metamorphism, the amount of water decreases. **(e)** None of these

12. What is the relationship between metamorphic foliation and sedimentary bedding?
(a) Sedimentary bedding is required in order for a rock to develop metamorphic foliation
(b) Sedimentary bedding and metamorphic foliation are two terms for the same phenomenon
(c) Sedimentary bedding and metamorphic foliation are generally parallel
(d) There is no regular relationship between sedimentary bedding and metamorphic foliation **(e)** None of these

13. A disconformity is _____.
(a) A rock unit that does not contain fossils
(b) An erosional surface between igneous and metamorphic rocks
(c) An erosional surface between horizontal sedimentary rocks
(d) An erosional surface between different rock types **(e)** None of these

14. What is the name for an erosion surface that separates two sets of sedimentary layers with non-parallel bedding planes?
(a) Cross bedding **(b)** Formation **(c)** Fault unconformity
(d) Angular unconformity **(e)** None of these

15. How do rock particles move during the passage of a P-wave through the rock?
(a) Back and forth parallel to the direction of wave travel
(b) Perpendicular to the direction of wave travel **(c)** In a rolling elliptical motion
(d) In a rolling circular motion **(e)** None of these

16. Which of the following statement is false:
(a) Most earthquakes occur at plate boundaries
(b) The time and location of most major earthquakes can be predicted several days in advance
(c) Earthquakes can be caused by normal, reverse and strike-slip faulting
(d) P-waves travel faster than both S-waves and Surface waves **(e)** None of these

17. Which of the following statement about rock deformation is false?
(a) Deep crustal rocks are more likely to deform ductily than shallow crustal rocks
(b) Hotter rocks are more likely to deform ductily than cooler rocks
(c) Most sedimentary rocks are more deformable than igneous rocks
(d) Rocks under low confining pressure are more likely to deform ductily than rocks under high confining pressure **(e)** None of these

18. If the sedimentary rocks on a geologic map form a zigzag pattern, the underlying structure probably consists of _____.
(a) Horizontal anticlines and synclines **(b)** Plunging anticlines and synclines
(c) Domes and basin **(d)** Strike slip faults **(e)** None of these

19. A fault plane strikes north-south and dips steeply to the west. Geologic observations indicate that most of the fault movement was vertical and that Mesozoic rocks occur east of the fault and Paleozoic rocks occur west of the fault. What type of fault is this?
(a) Normal **(b)** A right lateral strike slip **(c)** Reverse
(d) All of these **(e)** None of these

20. Which of the following types of tectonic forces tends to push two sides of a body in opposite directions so that they slide horizontally past one another?
(a) Tensional forces **(b)** Shearing forces **(c)** Compressive forces **(d)** None of these

PART-II

NOTE: **(i)** **Part-II** is to be attempted on the separate **Answer Book.**
(ii) Candidate must write **Q. No.** in the **Answer Book** in accordance with **Q. No.** in the **Q. Paper.**
(iii) Attempt **ONLY FOUR** questions from **PART-II. ALL questions carry EQUAL marks.**
(iv) Extra attempt of any question or any part of the attempted question will not be considered.

Q. No.2. Discuss three types of collision of Plate boundaries with reference to Plate system of Pakistan. **(20)**

Q. No.3. How the Earthquake is located? How the destruction was made by earthquake in 2005 in Pakistan? Discuss briefly. **(20)**

Q. No.4. Differentiate Structural Geology and Tectonics. Enlist classification of fault based on Slip and attitude of fault and attitude of strata with brief description and diagrams. **(20)**

Q. No.5. Describe the tertiary succession of lower Indus Basin. **(20)**

Q. No.6. How minerals are classified? Discuss and enlist the classification of minerals other than silicate. **(20)**

Q. No.7. What do you understand by Sedimentary Environment? Discuss in details the Marine environment. **(20)**

Q. No.8. Write short notes on any **FOUR** of the following: **(5 each)** **(20)**
(a) Present is key to the past (b) Stages of deformation
(c) Stratigraphy of Khewra Gorge (d) Kinds of unconformities
(e) Mechanism of metamorphism (f) Hardness of the minerals and scale

****

FEDERAL PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS IN BS-17 UNDER THE FEDERAL GOVERNMENT, 2013

Roll Number

GEOLOGY, PAPER-II

TIME ALLOWED:	**(PART-I MCQs)**	**30 MINUTES**	**MAXIMUM MARKS: 20**
THREE HOURS	**(PART-II)**	**2 HOURS & 30 MINUTES**	**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.**

PART-I (MCQs) (COMPULSORY)

Q.1. (i) Select the best option/answer and fill in the appropriate Circle ○ on the **OMR Answer Sheet. (20x1=20)**

(ii) Answers given anywhere, other than OMR Answer Sheet, shall not be considered.

1. Mark the correct statement about Platinum Group Minerals (PGM).
(a) PGM occurs as immiscible segregation in early magmatic stage and is locked up in silicates
(b) They are primarily localized in ultramafic rocks
(c) Hydro thermal activity plays a significant role in the concentration of Platinum group elements
(d) All are correct **(e)** None of these

2. Chrysolite Asbestos result from the:
(a) Magmatic liquid **(b)** Alteration of Serpentine **(c)** Alteration of Olivine to Serpentine
(d) Hydrothermal solutions **(e)** None of these

3. Mn-ore of chemical grade should have:
(a) 0-95% of Mn **(b)** 82-87% of Mn **(c)** 74-78% of Mn
(d) 60-63% of Mn **(e)** None of these

4. The major elements is Mn-nodules are:
(a) Fe and Mn **(b)** Fe, Mn and Ni **(c)** Fe, Mn, Ni and Cu
(d) Fe, Mn, Ni, Cu and Co **(e)** None of these

5. Iron Sulphide minerals are often indicators of the?
(a) Geochemical conditions under which they are formed **(b)** Depositional Environments
(c) Transportation agencies **(d)** Both (a) and (b) **(e)** None of these

6. Which is the correct statement about Pyrite:
(a) It has a wide range of thermal stability upto 743^0C
(b) It is formed in marine depositional environment
(c) It deposits under neutral to alkaline conditions
(d) All the above statements are correct **(e)** None of these

7. Molybdenum Steels are used in:
(a) Aircraft **(b)** Automobiles **(c)** Oil machinery
(d) All of these **(e)** None of these

8. Which is the most stable mineral towards weathering:
(a) Quartz **(b)** Feldspar **(c)** Hornblende
(d) Olivine **(e)** None of these

9. Which rare earth element replaces Zirconium in Zircon:
(a) Thorium **(b)** Cerium **(c)** Hafnium **(d)** None of these

10. Epidote crystallises in:
(a) Orthorhombic system **(b)** Monoclinic system **(c)** Triclinic system
(d) Cubic system **(e)** None of these

11. The degree of transparency of a mineral is known as:
(a) Schillerization **(b)** Diaphaneity **(c)** Phosphorescence **(d)** None of these

12. Polymorphous elements like carbon are called:
(a) Semi-ploytropic **(b)** Polytropic **(c)** Allotropic **(d)** None of these

13. Which type of drainage pattern develops in folded or tilted blocks:
(a) Dendretic pattern **(b)** Trellis pattern **(c)** Rectangular pattern **(d)** None of these

14. A plain of eroded bed rock developed between mountain and basin areas is known as:
(a) Pediment **(b)** Playa **(c)** Piedment **(d)** Peneplains **(e)** None of these

15. Amorphous substances are:
(a) Isotropic **(b)** Anisotropic **(c)** Uniaxial **(d)** Biaxial **(e)** None of these

16. Wind does erosion in:
(a) Attrition **(b)** Abrasion **(c)** Deflation **(d)** All these processes **(e)** None of these

17. A fossil which assumes to be the intermediate form between man and ape is:
(a) Australopithecus **(b)** Ramapithecus **(c)** Sivapithecus
(d) Sinanthropus **(e)** None of these

18. Stromatolites are only preserved in:
(a) Shales **(b)** Sandstones **(c)** Carbonates **(d)** Coal **(e)** None of these

19. Trace fossils are also known as:
(a) Organic fossils **(b)** Ichno fossils **(c)** Ripple fossils **(d)** None of these

20. What are the applications of condones:
(a) In Biostratigraphy **(b)** In Paleoecology **(c)** In Hydrocarbon Exploration
(d) All of these **(e)** None of these

PART-II

NOTE: **(i)** **Part-II** is to be attempted on the separate **Answer Book.**
(ii) Candidate must write **Q. No.** in the **Answer Book** in accordance with **Q. No.** in the **Q. Paper.**
(iii) Attempt **ONLY FOUR** questions from **PART-II. ALL** questions carry **EQUAL marks.**
(iv) Extra attempt of any question or any part of the attempted question will not be considered.

Q. No.2. Discuss the processes of mineralization of Pegmatites. **(20)**

Q. No.3. Discuss in detail the geology of non-metallic minerals in Northern Areas of Pakistan. **(20)**

Q. No.4. Discuss various types and patterns of slope failures in Pakistan and their stability techniques **(20)**

Q. No.5. Describe the economic significance of the Pab Formation in Lower Indus Basin. **(20)**

Q. No.6. (a) Discuss in detail the causative mechanisms of earthquakes in Pakistan **(15)**
(b) How was the Rector's scale devised? **(5)**

Q. No.7. Discuss the occurrence and industrial utilization of bentonite deposits of Pakistan. **(20)**

Q. No.8. Write short notes on **FOUR** of the following: **(5 each)** **(20)**
(a) Types of Aquifers
(b) Hydrological cycle
(c) Sequence stratigraphic approach in exploration of hydrocarbons
(d) Foundation analysis
(e) Exploration in Badin Block in Lower Indus Basin with reference to Stratigraphic Traps Exploration Strategy

****

www.csshub.com.pk