

# FEDERAL PUBLIC SERVICE COMMISSION



## COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS IN BS-17 UNDER THE FEDERAL GOVERNMENT, 2011

Roll Number

### GEOLOGY, PAPER-I

<b>TIME ALLOWED:</b>	<b>(PART-I MCQs)</b>	<b>30 MINUTES</b>	<b>MAXIMUM MARKS: 20</b>
<b>THREE HOURS</b>	<b>(PART-II)</b>	<b>2 HOURS &amp; 30 MINUTES</b>	<b>MAXIMUM MARKS: 80</b>
<b>NOTE: (i) First attempt PART-I (MCQs) on separate Answer Sheet which shall be taken back after 30 minutes.</b>			
<b>(ii) Overwriting/cutting of the options/answers will not be given credit.</b>			

### (PART-I MCQs) (COMPULSORY)

- Q.1.** Select the best option/answer and fill in the **appropriate box** on the **Answer Sheet**. (1 x 20=20)
- (i) Following are the members of plagioclase family:  
(a) Albite, Oligoclase, Andesine (b) Andesine, Labradorite, Bytownite  
(c) Oligoclase, Andesine, Labradorite (d) Labradorite, Bytownite, Anorthite (e) All of these
- (ii) Chaman Transform Zone is characterized:  
(a) Mainly by strike-slip faulting with minor subduction  
(b) Mainly by dip-slip faulting with minor subduction  
(c) Mainly by subduction with minor strike-slip faulting  
(d) Mainly by obduction with minor strike-slip faulting (e) None of these
- (iii) A blocky and fragmented form of lava occurring in flows with fissured and angular surfaces is known as:  
(a) Ad lava (b) Ac lava (c) Ab lava (d) Aa lava (e) None of these
- (iv) The following formations are known respectively as Upper, Middle and Lower Productus Limestone:  
(a) Amb, Wargal and Chiddru (b) Chiddru, Wargal and Amb  
(c) Wargal, Amb and Chiddru (d) Amb, Chiddru and Wargal (e) None of these
- (v) The following mineral shows two sets rhombic cleavage:  
(a) Hornblende (b) Grunerite (c) Tremolite (d) Actinolite (e) All of these
- (vi) Physical weathering process in which sheets of rock are fractured and detached from an outcrop is termed as:  
(a) Degeneration (b) Transpiration (c) Exfoliation (d) Deformation (e) None of these
- (vii) Mohorovicic Discontinuity is the boundary between:  
(a) Crust and Lithosphere (b) Sima and Sial  
(c) Crust and Mantle (d) Crust and Asthenosphere (e) None of these
- (viii) Type of foliation associated with very fine grained pelitic rocks metamorphosed to low grade is known as:  
(a) Phyllitic Structure (b) Gneissic Structure  
(c) Schistose Structure (d) Slaty Cleavage (e) None of these
- (ix) Which of the following statements is true?  
(a) Apatite is harder than Fluorite (b) Quartz is harder than Calcite  
(c) Corundum is harder than Quartz (d) Diamond is harder than all minerals (e) All of these
- (x) Among following which are classed as chronostratigraphic units:  
(a) Era, Period, Epoch (b) Group, Formation, Member  
(c) System, Series, Stage (d) Palaeozoic, Cretaceous, Miocene (e) None of these
- (xi) Which of the following group of rocks is known as basic igneous rocks?  
(a) Monzonite, Syenite, Rhyolite (b) Granite, Diorite, Granodiorite  
(c) Trachyte, Andesite, Dacite (d) Gabbro, Norite, Dolerite (e) None of these

## **GEOLOGY, PAPER-I**

- (xii) Antistress and stress minerals are discussed in the context of:  
(a) Metamorphic rocks (b) Sedimentary rocks  
(c) Plutonic rocks (d) Volcanic rocks (e) All of these
- (xiii) Island Arc is a linear or arcuate chain of volcanic islands at:  
(a) Transform Plate Boundary (b) Convergent Plate Boundary  
(c) Mid-Oceanic Ridge (d) Divergent Plate Boundary (e) None of these
- (xiv) Axial Fold Belt is the dividing feature between two basins.  
(a) Indus and Kakar Khurasan (b) Lower and Upper Indus  
(c) Southern and Central Indus (d) Indus and Balochistan (e) None of these
- (xv) Current ripples are used to indicate:  
(a) Velocity of flow (b) Direction of flow  
(c) Line of flow (d) Gradient of flow (e) All of these
- (xvi) Floating invertebrates are known as:  
(a) Benthos (b) Nektons (c) Zooplanktons (d) Phytoplanktons (e) None of these
- (xvii) Zaluch Nala is situated in:  
(a) Eastern Salt Range (b) Western Salt Range  
(c) Surghar Range (d) Central Salt Range (e) None of these
- (xviii) Expression of the septum on the wall surface of Ammonoids is known as:  
(a) Growth lines (b) Suture (c) Ribs (d) Umbilicus (e) None of these
- (xix) Blue Schist is comprised of:  
(a) Smectite and Quartz (b) Glaucophanes, Lawsonite and Quartz  
(c) Epidote and Albite (d) Marble and Quartzite (e) None of these
- (xx) The hinge line of a doubly plunging syncline is:  
(a) Curvilinear (b) Rectilinear (c) Horizontal (d) Vertical (e) None of these

### **PART-II**

- NOTE:**(i) **PART-II** is to be attempted on separate Answer Book.  
(ii) **Attempt ONLY FOUR questions from PART-II. All questions carry EQUAL marks.**  
(iii) **Extra attempt of any question or any part of the attempted question will not be considered.**

- Q.2.** Define fossil, discuss various modes of fossilizations. Describe main morphological features of class Trilobita of Phylum Arthropoda. (20)
- Q.3.** What are faults, how they are recognized in field? Give the classification of faults based on Slip types. (20)
- Q.4.** Describe the morphological and structural characters of Salt Range. Discuss its importance in geology of Pakistan. Give the lithological characteristics of Salt Range Formation. (20)
- Q.5.** In the context of earthquake, define epicentre and focus. Using P and S waves how the epicentre of an earthquake is located? (20)
- Q.6.** How rock-forming minerals are classified on the basis of silicate structure? Give example of each class. Write down the physical properties of mica group. (20)
- Q.7.** With examples, discuss the geological parameters which control the landforms of an area. Describe the landforms resulted by sedimentation through ice and meltwater. (20)
- Q.8.** Write notes on the following: (5+5+5+5 = 20)  
(a) Magmatic Differentiation (b) Diagenesis  
(c) Dolomitization (d) Metasomatism

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Roll Number

### GEOLOGY, PAPER-II

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### (PART-I MCQs) (COMPULSORY)

- Q.1.** Select the best option/answer and fill in the **appropriate box** on the **Answer Sheet**. (1 x 20=20)
- (i) The quality of coal of Thar coal deposits is:  
(a) Anthracitic (b) Bituminous (c) Lignitic (d) Sub-bituminous (e) All of these
- (ii) Liptinite type of maceral group, after maturation is capable to generate:  
(a) Condensate (b) Oil (c) Gas (d) Coal (e) None of these
- (iii) Dolomite deposits of Jhampir (Sindh) occur in:  
(a) Laki Formation (b) Nari Formation  
(c) Dungan Formation (d) Kirthar Formation (e) All of these
- (iv) The heavy minerals, Zircon, Rutile and Apatite are found in:  
(a) Sand and Sandstone (b) Chalk and Limestone  
(c) Kaolinite and Claystone (d) Chlorite and Claystone (e) None of these
- (v) During geological mapping the following can be used as base map:  
(a) Toposheet (b) Aerial Photograph  
(c) Satellite Image (d) Habitation map (e) All of these
- (vi) Hemimorphite, Franklinite and Smithsonite are ores of:  
(a) Cu (b) Ti (c) Cr (d) Zn (e) None of these
- (vii) Following is a very well proven reservoir rock in Lower Indus Basin:  
(a) Gaj Formation (b) Nari Formation (c) Goru Formation  
(d) Parh Limestone (e) None of these
- (viii) F. H. Lahee and R. R. Compton are the authors of the famous books on the subject:  
(a) Geomorphology (b) Field Geology  
(c) Structural Geology (d) Engineering Geology (e) None of these
- (ix) Khas Kheli oil field in lower Sindh was discovered in:  
(a) 1991 (b) 1981 (c) 1971 (d) 1961 (e) None of these
- (x) Warsak dam is built on:  
(a) Kabul River (b) Kurram River (c) Gomal River (d) Swat River (e) None of these
- (xi) Alpine-type Chromite deposits occur at:  
(a) Chagai (b) Kohistan (c) Raskoh (d) Muslimbagh (e) All of these
- (xii) Which of the following prospecting method is most suitable for locating Asbestos, Pyrrhotite and Manganese?  
(a) Air-born magnetic survey (b) Ground magnetic survey  
(c) Seismic method (d) Electrical Resistivity method (e) All of these

## **GEOLOGY, PAPER-II**

- (xiii) To obtain information about magnetic minerals from Stereogram/Stereopair following instrument is used:  
(a) Stereometer (b) Magnetometer (c) Resistivitymeter  
(d) Seismometer (e) None of these
- (xiv) Following rocks are not suitable as construction materials due to ASR and ACR hazards respectively:  
(a) Granite and Diorite (b) Dolomite and Calcite  
(c) Andesite and Dolomite (d) Basalt and Gabbro (e) None of these
- (xv) Presence of Pegmatite is especially an indicator of possible occurrence of:  
(a) Base-metals (b) Radioactive minerals  
(c) Magnetic minerals (d) Non-metals (e) All of these
- (xvi) For exploration and determination of underground water quality most suitable method is:  
(a) Seismic (b) Magnetic (c) Geochemical (d) Resistivity (e) None of these
- (xvii) If a map shows distribution of rocks and other geological materials (features also) of different ages over the Earth's surface or below, it is known as:  
(a) Topographic Map (b) Geological Map  
(c) Physiographic Map (d) Mine-Survey Map (e) None of these
- (xviii) A map which shows the surface contours on an imaginary surface to which water would rise in a drilled well is termed as:  
(a) Piezometric Contour Map (b) Groundwater Contour Map  
(c) Water Table Contour Map (d) Sonometric Contour Map (e) All of these
- (xix) Following is the term describes the Iron-Oxide rich zone which lies above a Sulphide bearing ore deposit:  
(a) Greisen (b) Genesis (c) Gossan (d) Gneiss (e) None of these
- (xx) Oil seepages in the Sulaiman Range are from the rocks of the following ages:  
(a) Triassic and Jurassic (b) Jurassic and Cretaceous  
(c) Cretaceous and Paleocene (d) Paleocene and Eocene (e) All of these

## **PART-II**

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| <b>NOTE:</b> (i) <b>PART-II</b> is to be attempted on separate Answer Book.<br>(ii) <b>Attempt ONLY FOUR questions from PART-II. All questions carry EQUAL marks.</b><br>(iii) <b>Extra attempt of any question or any part of the attempted question will not be considered.</b> |
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- Q.2.** Name various geochemical prospecting methods for minerals. Describe any one of them in detail with examples. (20)
- Q.3.** What geological considerations are essential before selecting a site for and during construction of a tunnel? Discuss in detail. (20)
- Q.4.** Elaborate Hydrologic Cycle. How the water-flow budget of an hydrologic basin is calculated? (20)
- Q.5.** What are Kimberlites? Discuss their distribution in space and time, geological setting and petrography. (20)
- Q.6.** (a) Give the criteria for lithological interpretation on an aerial photograph. (10)  
(b) Briefly discuss the merits and demerits of Aerial Photography and Satellite Remote Sensing over each other. (10)
- Q.7.** Write about the tectonic setting and metallogenic province of RecoDiK Copper – Gold Belt of Balochistan. Discuss the genesis and petrography of the deposit. (20)
- Q.8.** Give the occurrence of coal deposits in the Kirthar Province of Lower Indus Basin. Describe their stratigraphic association, coal varieties and reserves. (20)

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