

FEDERAL PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS
IN BPS-17 UNDER THE FEDERAL GOVERNMENT, 2001.

GEOLOGY, PAPER-I

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

NOTE: Attempt FIVE questions in all, including question No.8 which is COMPULSORY. All questions carry EQUAL marks.

1. Classify the fault genetically and briefly describe with the help of suitable diagrams.
2. Discuss the rock cycle and explain how it is related to plate tectonics.
3. What are the basic time stratigraphic units and their corresponding time units? Why did geologist find it necessary to establish these two kinds of units?
4. Briefly describe Phylum Mollusca and give its classification up to class level with ages.
5. Briefly describe the major plutonic and volcanic rocks with their composition. Give some examples from Pakistan.
6. Write a comprehensive note on Geodynamics of Pakistan.
7. Write short notes on the following:
 - (a) Differential weathering
 - (b) Primary structures of igneous rock
 - (c) Geomorphic cycle
 - (d) Metamorphic Facies

COMPULSORY QUESTION

8. Write only the correct answers in the Answer Book. Do not reproduce the questions:
 - (1) The two minerals calcite and aragonite are polymorphs. This means that they have the same:

(a) crystal <u>habit</u>	(b) <u>hardness</u>	(c) <u>crystalline structure</u>
(d) chemical composition	(e) density	(f) None of these.
 - (2) The sentence "The present is the key to the past." is a common restatement of the:

(a) law of <u>superposition</u>	(b) principle of <u>lateral continuity</u>
(c) principle of <u>uniformitarianism</u>	(d) law of diminishing returns
(e) principle of <u>cross-cutting relationships</u>	(f) None of these.
 - (3) When a conglomerate contains particles that are sharp and angular, geologists call it:

(a) an <u>arkose</u>	(b) a <u>travertine</u>	(c) a <u>breccia</u>
(d) a <u>quartz arenite</u>	(e) a <u>coquina</u>	(f) None of these
 - (4) What type of rock makes up the greatest portion of the volume of the continental crust:

(a) <u>limestone</u>	(b) <u>gabbro</u>	(c) <u>granite</u>
(d) <u>basalt</u>	(e) <u>shale</u>	(f) None of these

GEOLOGY, PAPER-I

- (5) Geologists can recognize a gap in a sequence of sedimentary rocks that represents a hiatus in the record of geologic time by locating a feature known as:
- (a) an exfoliation dome (b) an isograd
(c) a geologic column (d) a varve
(e) an unconformity (f) None of these.
- (6) A fossil is most useful to geologists as an index fossil if:
- (a) it is only found in one particular place in the world
(b) the species from which it formed had survived, unchanged, for an extremely long time.
(c) the species from which it formed is closely related to a modern species
(d) it is only found in sediments deposited during a short interval in Earth's history.
(e) it is very different in appearance from other fossils around it
(f) None of these.
- (7) A geologist wants to distinguish between mineral samples by seeing how well they resist scratching. What standard should he use as the basis for comparing samples?
- (a) the Richter scale (b) Steno's laws (c) the Mohs scale
(d) the Hutton scale (e) the Carnegie index
(f) None of these.
- (8) Chalk, coquina, tufa, and travertine are names applied to different varieties of:
- (a) mudstone (b) conglomerate (c) sandstone
(d) Evaporite (e) limestone (f) None of these.
- (9) Seismic body waves
- (a) travel more slowly than surface waves
(b) may be either compressional or shear waves
(c) are produced by the energy that is released at an earthquake epicenter
(d) cannot be detected by an inertial seismograph
(e) are produced in the Earth's outer core
- (10) A geologist describing a fault discovers that rocks in the foot wall block have moved upward, relative to rocks in the hanging wall block. What kind of fault has he discovered?
- (a) a strike-slip fault (b) a transform fault (c) a reverse fault
(d) a normal fault (e) an oblique fault (f) None of these
- (11) According to the 19th century geologists who first developed the idea, a geosyncline is:
- (a) filled almost entirely with volcanic rocks
(b) a huge fold in the middle of a craton
(c) produced by continental convergence
(d) a great trough that gradually deepens as it fills
(e) produced by seafloor spreading
(f) None of these.
- (12) All of the deep earthquakes in the world are associated with
- (a) spreading centers (b) mantle plumes (c) ocean trenches
(d) plate triple junctions (e) continental shelves (f) None of these
- (13) The oldest rocks on the Earth are found
- (a) in accreted terranes (b) on mid-ocean ridges (c) in cratons
(d) an orogens (e) in subduction zones (f) None of these

GEOLOGY, PAPER-1

- (14) One important outcome of H.F. Reid's study of the great 1906 earthquake in San Francisco was the development of a new concept called:
 - (a) isostasy
 - (b) elastic rebound
 - (c) free oscillations
 - (d) mantle convection
 - (e) risk assessment
 - (f) None of these

- (15) Ophiolite complexes that are located high in the Himalayas Mountains of Asia were probably once pieces of:
 - (a) an island arc
 - (b) a craton
 - (c) the outer core
 - (d) the oceanic crust
 - (e) a continental shelf
 - (f) None of these

- (16) What part of the Earth is immediately beneath the Moho?
 - (a) the outer core
 - (b) the asthenosphere
 - (c) the inner core
 - (d) the lower lithosphere
 - (e) the mesosphere
 - (f) None of these

- (17) Andesitic magma is commonly produced by
 - (a) wet partial melting in subduction zones
 - (b) friction in fold-and-thrust mountains
 - (c) compression due to deep burial
 - (d) pressure release at midocean ridges
 - (e) heat rising in mantle plumes
 - (f) None of these.

- (18) Porosity is a measure of:
 - (a) the percentage of a sediment's (or a rock's) volume that is open space
 - (b) how high the water pressure in a rock or sediment can be
 - (b) the shape and average size of open spaces in a rock or sediment
 - (d) how well the open spaces in a rock or sediment are connected to each other
 - (e) how easily water will flow through a rock or sediment
 - (g) None of these.

- (19) Geologists use the equation called Darcy's Law to calculate:
 - (a) the depth to the water table
 - (b) the discharge through an aquifer
 - (c) the water pressure in an aquifer
 - (d) the volume of an aquifer
 - (e) the porosity of an aquifer
 - (f) None of these.

- (20) A sinkhole is caused by:
 - (a) pumping water from a well
 - (b) collapse of the land over a cave
 - (c) a violent eruption of heated groundwater
 - (d) tectonic settling between normal faults
 - (e) melting of buried ice
 - (f) None of these.

FEDERAL PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS
IN BPS-17 UNDER THE FEDERAL GOVERNMENT, 2001.

GEOLOGY, PAPER-II

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

NOTE: Attempt FIVE questions in all, including question No.8 which is
COMPULSORY. All questions carry EQUAL marks.

1. Briefly describe the case histories of the following oil and gas fields.
(a) Mari Gas Field (b) Khaskhaili Oil Field
(c) Dhulian Oil Field (d) Dhodhak Condensate Field
2. How gravity and magnetic techniques are useful in hydrocarbon exploration?
3. Describe various kinds of gemstones and give their occurrences from Pakistan.
4. Describe the environmental conditions of the transformation of organic matter into kerogen. How the expulsion occurs from the source rock?
5. Write a detail note on salinity and water logging problems in Sindh Region.
6. How sites for dams construction are investigated? Which site you will suggest for dam construction on Indus River? Discuss.
7. Write SHORT NOTES on the following:
(a) Types of aquifers (b) Geochemical exploration technique
(c) Radio active minerals of Pakistan (d) Metallogeny of Pakistan

COMPULSORY QUESTION

8. write only the correct answers in the answer books. Do not reproduce the questions.
 - (1) The most necessary property of a reservoir is
(a) Porosity (b) voids
(c) Permeability (d) None of these.
 - (2) The oldest coal field of Pakistan is found in rock of
(a) Cambrian age (b) Tertiary age
(c) Permian age (d) None of these.
 - (3) The youngest oil reservoir rock of Indus Basin is
(a) Khera sandstone (b) Murree sandstone
(c) Pab Sandstone (d) None of these.
 - (4) The dam situated on Kabul River in Pakistan is known as
(a) Warsak dam (b) Hub dam
(c) Tarbela dam (d) None of these.
 - (5) The toposheet that is used for geological mapping is usually of scale
(a) 1:50,000 (b) 1:100,000
(c) 1:63,360 (d) None of these.
 - (6) One ton of oil is equal to US bbl
(a) 7.33 (b) 3.77
(c) 37.7 (d) None of these.

GEOLOGY, PAPER-II

- (7) In Khewra Salt mines which method is used for mining salt
(a) open mining (b) Pillar & room
(c) None of these.
- (8) Best quality of Barite is reported from
(a) Khuzdar (b) Kallat
(c) Ziarat (d) None of these.
- (9) In which of the following carbon content is the highest
(a) Peat (b) Bituminous
(c) Lignite (d) None of these.
- (10) Measuring units for natural gas is
(a) BTU (b) MCMCF
(c) BBL (d) None of these.
- (11) The Petroleum geology of Pakistan book is written by
(a) V.N.Qadri (b) S.M.G.J.Qadri
(c) I.B.Qadri (d) None of these.
- (12) Velocity of P waves is minimum in
(a) Salt dome (b) Basalt
(c) Shale (d) None of these.
- (13) Isopach contour map represent
(a) True thickness (b) Drill thickness
(c) Apparent thickness (d) None of these.
- (14) The Travertine mineral is considered to be the result of
(a) Placer deposit (b) Hot spring deposit
(c) Fluvial deposit (d) None of these.
- (15) Aquifer is a rock which has one of the following water
(a) Connate water (b) Percolated water
(c) Meteoric water (d) None of these.
- (16) Major causes of land slide is
(a) Gravity (b) Vertical bedding
(c) Rainfall (d) None of these.
- (17) The instrument which measure the intensity of earthquake is
(a) Geophone (b) Seismograph
(c) Magnetometer (d) None of these.
- (18) Coal is found in one of the following environment
(a) Marine (b) Terrestrial
(c) Shoreline (d) None of these.
- (19) Remote Sensing Exploration is highly useful for
(a) water (b) mineral
(c) hydrocarbon (d) None of these.
- (20) Which one of the following is a trace element in petroleum hydrocarbon
(a) C (b) H
(c) S (d) None of these.

FEDERAL PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS IN BPS-17, UNDER THE FEDERAL GOVERNMENT, 2002.

GEOLOGY, PAPER-I

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

Note: Attempt FIVE questions in all, including Question No.8 which is COMPULSORY. All questions carry EQUAL marks.

1. Define bedding and stratification. Discuss various types of bedding. Which features are employed to check whether the beds are right-side-up or over turned?
2. What are unconformities? Discuss various stages involved in their development and describe with the help of diagrams various types of unconformities.
3. What is the base of division of crystals into Systems and Classes? What are the peculiarities of the "NORMAL CLASS" of a system? Describe the symmetry of the normal class of the Hexagonal System.
4. What are FELDSPARS? Keeping in view the Al/Si distribution over the non-equivalent tetrahedral sites in the structure of feldspar. What is a disordered feldspar?
5. Write an essay on the Foraminifera with special reference to their distribution in Pakistan.
6. What is incongruent melting? Draw Phase diagram of the binary system-Leucite-Silica. Describe the characteristic features of this system.
7. Discuss the differences in the Petrography; chemistry and occurrence of the alkali basalt and tholeiitic basalt.

COMPULSORY QUESTION

8. (A) What is the difference between the following pairs (answer only in one or two lines).
 - (1) Orthoclase and Sanidine
 - (2) Microcline and Maximum Microcline
 - (3) Biotite and phlogopite
 - (4) Octahedral and Six-fold Coordination
 - (5) Normal and reverse fold
 - (6) Stalactite and stalagmite
 - (7) Gabbro and granite.
- (B) What is wrong with the following sentences:
 - (8) There is no difference between a fault and a joint.
 - (9) Forsterite is formed by the thermal metamorphism of sandstone
 - (10) In the thermal metamorphism of impure Mg-limestone, a series of reaction are involved with progressive metamorphism of the system.
 - (11) Essential minerals within Granite and Gabbro are quartz, alkali feldspar and biotite.

GEOLOGY, PAPER-I

- (12) M.K.T separates the Indo-Pak Plate from the Kohistan Island arc.
- (13) Hardness of quartz is 4 in the Mohs Scale of hardness.
- (14) Kyanite and sillimanite are polymorphs of Al_2O_3 .

(C) Write only the correct answer in the Answer Book. Do not reproduce the question.

(15) Mg occupies the octahedral/tetrahedral coordinated positions in the silicate structure.

(16) The average thickness of oceanic crust is:
(a) 5 km (b) 35 km (c) 40 km
(d) None of these.

(17) Eclogite is the high pressure equivalent of:
(a) Gabbro (b) Diorite (c) Sandstone
(d) None of these.

(18) The basalt-andesite – dacite-rhyolite series of rocks occur in:
(a) Island arc environment
(b) Continental marginal area
(c) Orogenic belts.
(d) None of these.

(19) On the A.F.M. diagram, the tholeiitic series exhibit:
(a) a non-iron enrichment trend
(b) a high-iron enrichment trend
(c) a moderate iron enrichment trend
(d) None of these.

(20) When there are two generations of crystals in the igneous rocks, the texture is described as:
(a) Porphyritic
(b) Porphyroblastic
(c) Aphyric
(d) None of these.

FEDERAL PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS
IN BPS-17, UNDER THE FEDERAL GOVERNMENT, 2002.

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GEOLOGY, PAPER-II

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

Note: Attempt FIVE questions in all, including Question No. 8, which is
COMPULSORY. All questions carry EQUAL marks.

1. What are Salt domes? Discuss their evolution and economic significance.
2. Discuss mineral deposits of Hydrothermal Origin.
3. Make a diagram of a modern drilling rig, label its various parts and discuss the function of the water-based and oil-based drilling muds in Oil well drilling.
4. Briefly discuss the geological factors, which should be taken into consideration while selecting a suitable site for the construction of dams.
5. Give an account of the geological materials used as building stones.
6. What geophysical technique(s) is/are recommended for the prospection of iron-ore deposits? Give details of the techniques and instrument(s) used for this type of survey.
7. Write notes on the following:
(a) lag time or bottom-up figure (b) coal and its varieties
(c) Marble deposits in Pakistan.

COMPULSORY QUESTION

8. Write only the correct answer in the Answer Book. Do not reproduce the question.
 - (1) Ax type carbonate minerals are:
(a) Calcite (b) dolomite (c) Magnesite
(d) Siderite (e) None of these
 - (2) Economic deposits of chromite occur at:
(a) Muslim bagh Baluchistan (b) Chillas.....Kohistan
(c) Dargai.....Malakand (d) Hazara Kohistan
(e) None of these
 - (3) Barite in the drilling mud is used for increasing:
(a) mud weight (b) viscosity (c) None of these.
 - (4) Beside marble, which of the following rock(s) is/are used for making tiles (after cutting and polishing):
(a) dolerite (b) serpentinite
(c) Granite (d) Sandstone
(e) None of these
 - (5) Is it true that a rock may be porous but not permeable:
(a) Yes (b) No
 - (6) Which of the following minerals are used in the glass industry:
(a) Silica minerals (b) feldspar
(c) Olivine (d) garnet
(e) None of these

GEOLOGY, PAPER-II

- (7) Which of the following minerals are used as gem minerals.
(a) Talc (b) diamond
(c) Corundom (d) None of these
- (8) How much percent of total energy is produced through nuclear and hydle style power generation in Pakistan:
(a) 10.3% (b) 41.4%
(c) 43.5% (d) any other
- (9) What is the total production of crude oil (daily basis) in Pakistan:
(a) 60,000 bbls (b) 1,00,000 bbls
(c) 70,000 bbls (d) any other figure
- (10) Which of the following minerals are oxide of iron:
(a) Hemafite (b) Magnetite
(c) Periclase (d) Siderite
(e) None of these
- (11) The dam constructed on river Jhehlum is known as:
(a) Tanda Dam (b) Warsak Dam
(c) Tarbella Dam (d) Mangla Dam
(e) None of these
- (12) Which of the following rock(s) is/are ideal for the accumulation of oil:
(a) fractured limestone (b) Shale
(c) Marle (d) Sandstone
(e) None of these
- (13) Landslide are commonly seen in:
(a) Murree Formation (b) Hazara Slates
(c) Abbottabad Formation (d) None of these.
- (14) Raw material for cement industry include:
(a) Limestone (b) Shale
(c) Clay (d) Slate
(e) Gypsum (f) None of these
- (15) Best quality emerd is reported from:
(a) Ophiolitic melange at Mingora (b) Hunza
(c) Chaagai (d) None of these
- (16) Which type of Coal shows highest carbon content:
(a) Peat (b) Lignite
(c) bituminous (d) None of these
- (17) Kimberlite are high Pressure ultrabasic rocks and are the main source of the terrestrial:
(a) diamond (b) phlogopite
(c) Jad. Pyroxene (d) None of these
- (18) Among the geophysical methods, resistivity method is most suitable for:
(a) Ground water survey (b) metallic mineral deposits
(c) Oil and gas exploration (d) None of these
- (19) How much energy is produced through burning natural gas in Pakistan:
(a) 41.4% (b) 4.5% (c) any other figure.
- (20) Why the O.G.D.C. is called as O.G.D.C.L. now.

FEDERAL PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS
IN PBS-17, UNDER THE FEDERAL GOVERNMENT, 2003

GEOLOGY, PAPER-I

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

NOTE: Attempt FIVE questions in all, including QUESTION NO.8 which is **COMPULSORY**. All questions carry **EQUAL** marks. Illustrate your answer with the help of sketches and diagrams where needed.

1. What are Sedimentary Rocks? How are these classified?
2. How Earth came into being? Briefly discuss theories about its origin.
3. What are EARTHQUAKES? How are these produced? What measures need to be adopted to mitigate the damage caused by the earthquakes?
4. What is meant by CONTINENTAL DRIFT and PLATE TECTONICS? Discuss various tectonic elements of the Earth.
5. What are FOSSILS? How are these preserved? List the most important INDEX Fossils of Pakistan.
6. What is STRATIGRAPHY? Briefly describe various stratigraphic units? Summarize the Paleozoic stratigraphy of the Salt Range.
7. What is a MINERAL? Discuss various ROCK-FORMING MINERALS with the help of examples.

COMPULSORY QUESTION

8. Write very short notes on the following:

- | | |
|---------------------------------|------------------------------|
| (1) Foraminifers | (2) Pseudotachylite |
| (3) Trachite | (4) Magma |
| (5) Seafloor spreading | (6) Magnetic anomalies |
| (7) Transform Faults | (8) Strike slip faults |
| (9) Graben | (10) Trench |
| (11) Island Arc | (12) Sheet Volcanic Eruption |
| (13) Liquefaction | (14) Crystal |
| (15) Salt pseudomorph structure | (16) Cross Bed |
| (17) Ripple Mark | (18) Pyrope |
| (19) Amphibole | (20) Manganese Nodule |

FEDERAL PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS
IN PBS-17, UNDER THE FEDERAL GOVERNMENT, 2003

GEOLOGY, PAPER-II

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

NOTE: Attempt FIVE questions in all, including QUESTION NO.8 which is **COMPULSORY**. All questions carry **EQUAL** marks. Illustrate your answer with the help of sketches and diagrams where needed.

1. Discuss METALLIC MINERAL RESOURCES of Pakistan? Suggest economically viable, mineral-based industries for various deposits?
2. What are the major COALFIELDS of Pakistan? Discuss their Rank and Quality, and propose their suitable industrial applications.
3. Briefly describe ORIGIN, MIGRATION AND OCCURRENCES of hydrocarbons. Discuss HYDROCARBON PROVINCES of Pakistan.
4. What are the important RADIOACTIVE MINERALS? Discuss their host rocks and occurrences in Pakistan.
5. What are LANDSLIDES? Discuss various hazards associate with them. Describe measures to control landslides.
6. Write any essay on the WATER RESOURCES OF PAKISTAN. Suggest measures to control water-logging and salinity.
7. Discuss GEOPHYSICAL PROSPECTING TECHNIQUES employed for the exploration of metals, water and hydrocarbons.

COMPULSORY QUESTION

8. Write Very Brief NOTES on the followings:

- | | |
|---|---------------------|
| (1) Confined and unconfined aquifer | (2) Monocline |
| (3) Orocline | (4) Gemstones |
| (5) Geochemical Exploration | (6) Soils. |
| (7) Any two engineering properties of Soils | (8) Reservoir Rocks |
| (9) Salt Dome | (10) Porosity |
| (11) Permeability | (12) Rockslide |
| (13) Any two properties of building stones | (14) Avalanche |
| (15) Point source of pollution | (16) BOD |
| (17) Bentonite | (18) Wire line logs |
| (19) Kerogen | (20) Trace elements |

FEDERAL PUBLIC SERVICE COMMISSION
COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS
IN BPS-17, UNDER THE FEDERAL GOVERNMENT, 2004

GEOLOGY, PAPER-I

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

NOTE: Attempt **FIVE** questions in all, including **Question No. 8** which is **COMPULSORY**.
 All questions carry **EQUAL** marks. Illustrate your answer with sketches where needed.

1. What methods are available to determine the age of the Earth? Describe its internal structure.
2. Discuss the origin of **MAGMA** in relation to plate tectonics. How different types of igneous rocks are formed from a single magma?
3. What is the significance of physical properties of minerals? Describe the **PYROXENE** group of minerals.
4. Define **FORMATION**. Describe the Tertiary sequence of strata in Sindh.
5. How do you classify **FAULTS**? Discuss the importance of **CHAMAN FAULT** in the geology of Pakistan.
6. How do you locate the epicenter of an earthquake? What measures are necessary for those areas of Pakistan which are seismically active?
7. Describe the morphology of **CEPHALOPODS**. What is their significance in the stratigraphy of Pakistan?

COMPULSORY QUESTION

8. Write very short notes on the following:

- | | |
|-----------------------|-------------------------|
| (1) Turbidites | (2) Asthenosphere |
| (3) Pillow lava | (4) Cross bedding |
| (5) Continental Slope | (6) Index fossil |
| (7) Arkose | (8) Enfoliation |
| (9) Submarine fan | (10) Kaolinite |
| (11) Braided river | (12) Main Mantle Thrust |
| (13) Eclogite | (14) Centre of symmetry |
| (15) Marker bed | (16) Syenite |
| (17) Bireferengence | (18) Globogerina |
| (19) Phyllosilicate | (20) Chert |

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GEOLOGY, PAPER-II

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

NOTE: Attempt **FIVE** questions in all, including **Question No. 8** which is **COMPULSORY**. All questions carry **EQUAL** marks. Illustrate your answer with sketches where needed.

1. What is a PORPHYRY Copper deposit? Describe the geology of SAINDAK area.
2. Describe the ranks of Coal. What are the problems of Utilization of THAR Coal?
3. What geological factors must be considered in the selection of sites for DAMS? Discuss the silting problem in Mangla and Tarbela.
4. Explain the DARCY Law. Can groundwater exploration be an alternate to Kalabagh Dam?
5. Describe the structure and stratigraphy of SUI gas field. What are the advantages and disadvantages of an international gas pipeline to Pakistan?
6. Discuss two common geophysical techniques employed in the exploration of oil and for groundwater.
7. What factors are responsible for LANDSLIDES? How will you stabilize a frequently sliding mass of shales and mudstones?

COMPULSORY QUESTION

8. Write very short notes on the following:

- | | |
|---------------------------|-------------------------|
| (1) Artesian Well | (2) Cable tool drilling |
| (3) Talc thermal deposits | (4) Ceramic minerals |
| (5) Tar sands | (6) Water logging |
| (7) Karez | (8) Lapidary |
| (9) Bouger anomaly | (10) Vitrinite |
| (11) Stratigraphic traps | (12) Geophones |
| (13) Sour gas | (14) Aquitards |
| (15) Formation Pressure | (16) Pile Foundation |
| (17) Onyx | (18) Resistivity log |
| (19) Compressive strength | (20) Decorative stones |

FEDERAL PUBLIC SERVICE COMMISSION
COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS
IN BPS-17, UNDER THE FEDERAL GOVERNMENT, 2005

GEOLOGY, PAPER-I

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

NOTE: Attempt **FIVE** questions in all, including **QUESTION NO.8**, which is **COMPULSORY**.
 All questions carry **EQUAL** marks. Illustrate your answer with sketches where needed.

1. Define mineral, crystal and rock. Describe the Feldspar group of minerals.
2. How do you classify Folds? Discuss the types of Folds in the mountains of Baloshitan.
3. Discuss the process of weathering and erosion. What is the importance of these processes?
4. Describe the morphology of Brachiopods. What is their significance in the stratigraphy of Pakistan?
5. What is the difference between magnitude and intensity of an earthquake? What are earthquake resistant structures?
6. What is Stratigraphic Code of Pakistan? Describe the Paleozoic rocks of the Salt Range.
7. How do the sediments convert to sedimentary rocks? Describe a few clastic sedimentary rock.

COMPULSORY QUESTION

8. Write very short note on the following:-

- | | |
|--------------------------|-----------------------|
| (1) Sedimentary facies | (2) Lithosphere |
| (3) Ropy lava | (4) Flute cast |
| (5) Continental shelf | (6) Fossil fuel |
| (7) Gray wack | (8) Extension joints |
| (9) Submarine Fan | (10) Garnet |
| (11) Graded river | (12) Chevron folds |
| (13) Hornfels | (14) Axis of symmetry |
| (15) Marker bed | (16) Peridotite |
| (17) Interference colors | (18) Discocyclina |
| (19) Cyclosilicate | (20) Pyrite |

FEDERAL PUBLIC SERVICE COMMISSION
COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS
IN BPS-17, UNDER THE FEDERAL GOVERNMENT, 2005

ZOOLOGY, PAPER-II

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

NOTE: Attempt **FIVE** questions in all, including **QUESTION NO.8**, which is **COMPULSORY**. All questions carry **EQUAL** marks. Give diagram wherever required.

1. (a) List the steps involved in the synthesis of protein starting from DNA. (9)
(b) Give an account of morphology, chemical composition and function of Golgi Complex. (11)
2. (a) Briefly discuss the mechanism involved in transport of Oxygen from lungs to tissue. (12)
(b) What are the different excretory products in animals? How and why these are produced in different animal groups? (8)
3. (a) Discuss the multiple allelic inheritance with reference to inheritance of ABO blood groups in man. (9)
(b) Define epistasis. How does it differ from dominance? Give three examples of epistasis interactions. (11)
4. (a) Give a brief account of the possible origin of life on this globe. (8)
(b) Compare Darwin's theory of natural selection with Lamarck's theory of Acquired characters. (12)
5. (a) Define an ecosystem. Discuss pond as an example of the complete ecosystem. (10)
(b) What is biogeochemical cycle? Describe phosphorus cycle. (10)
6. (a) Discuss the role of polyploidy in development of commercial varieties in plants. (10)
(b) Discuss the different enzymes involved in digestion in man. (10)
7. Write short notes on: (5 each)
(a) Sex linkage (b) lysosomes
(c) Pituitary Hormones (d) Air Pollution

COMPULSORY QUESTION

8. Write only the correct answer in the Answer Book. Do not reproduce the question.

- (1) The chemical composition of a chromosome is:
(a) Lipoprotein (b) Oligopolysaccharid
(c) Nucleoprotein (d) None of these
- (2) Lysosomes are responsible for:
(a) Protein synthesis (b) ATP formation
(c) Intracellular break down (d) None of these
- (3) Ribosomes are located on:
(a) cell membranes (b) Rough Endoplasmic reticulum
(c) Mitochondria (d) Nuclear membrane
(e) None of these
- (4) The metaphase chromosomes are thick because these:
(a) Multiply (b) Duplicate
(c) Coiled Coiling (d) None of these
- (5) Glycolysis occurs in:
(a) Cytoplasm (b) Mitochondria
(c) Cell membrane (d) All of these

ZOOLOGY, PAPER-II

- (6) Nerves convey the message in the form of:
(a) Physical impulse (b) Chemical impulse
(c) Electrical impulse (d) None of these
- (7) Follicle stimulating hormone is produced in:
(a) Ovary (b) Pituitary
(c) Hypothalamus (d) All of these
- (8) The primary excretory product is:
(a) Ammonia (b) Carbon dioxide
(c) faeces (d) None of these
- (9) Pepsin is responsible for digestion of:
(a) carbohydrate (b) lipid
(c) Protein (d) All of these
- (10) XXY individual in men is phenotypically:
(a) Male (b) Female
(c) Intersex (d) None of these
- (11) Sex linked genes are located on (in man):
(a) Only on X chromosome (b) Only on Y chromosome
(c) Sex chromosome (d) All of these
- (12) Mendelian Segregation is applicable to:
(a) Gametogenesis (b) Meiosis
(c) Spore formation (d) None of these
- (13) The number of the alleles of a gene in diploid individual is:
(a) Any number (b) One
(c) Two (d) Three
- (14) The gene mapping is measured in:
(a) Millimeters (b) Microns
(c) Angstrom (d) Centi Morgan
- (15) Genetic dominance concerns with the phenotypic expression in:
(a) Heterozygous (b) Homozygous
(c) Both (a) and (b) (d) None of these
- (16) The first living organism was:
(a) Algal cell (b) Virus
(c) Bacteria (d) None of these
- (17) Enzymes are chemically:
(a) carbohydrates (b) lipids
(c) lipoprotein (d) Proteins
- (18) Theory of Natural Selection was initially proposed by:
(a) Darwin (b) Wallace
(c) Both Darwin and Wallace (d) Lyell
- (19) Second law of thermodynamics demand:
(a) Energy stability (b) Energy loss during transfer of energy
(c) Energy flow from one form to another (d) None of these
- (20) The basic purpose of ecosystem is:
(a) Maintenance of organisms (b) Energy flow
(c) Chemical movements (d) None of these
