Manmohan Technical University
Office of The Controller of Examinations
Model Question, 2080 Asar

Level: Bachelor   Year/Part: I/II
Faculty: School of Engineering   F.M.: 50
Program: Civil   P.M.: 20
Subject: Engineering Geology (EG453CE)   Time: 3 Hours

Group "A"
[10 x 1 = 10 marks]

Instructions:
- Choose one answer out of four options.
- Use black ball pen for shading only one circle for correct option of a question in Answer Sheet which you have provided.
- No mark will be awarded for cutting, erasing, over writing and multiple circles shading

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1. The full form of IAEG is called _____.

a. International Association of Engineering Geology

b. Internal Association of Engineering Geology

c. Internal Association of Economic Geology

d. International Association of Environmental Geology

2. _____ when two plate boundaries diverge towards each other.

a. Mountain building process occur

b. Oceanic trench opens

c. Transform boundaries exists

d. River valley widens

3. Principal of Darcy's Law states that the rate of fluid flow through any porous medium is_____.

a. inversely proportional to the differences between hydraulic heads and directly proportional to the length of the column

b. directly proportional to the differences in hydraulic head and the length of the column

c. directly proportional to the differences in hydraulic head and inversely proportional to the length of the column

d. inversely proportional to the differences in hydraulic head and the length of the column

4. In a crystal habit, pinacoid is belonged to have _____.

a. single-sided face
b. two-sided faces
c. three-sided faces
d. seven-sided faces

5. Mark the correct order of high-grade metamorphic rock to the low-grade metamorphic rock as ....

a. Gneiss, slate, schist, phyllite
b. Gneiss, schist, phyllite, slate
c. Slate, phyllite, schist, gneiss
d. Slate, gneiss, phyllite, schist

6. The dip direction of a limestone bed is measured to be 240°/50°. What would be the strike, dip amount and dip direction of the sandstone bed?

a. N30°W/50°SW
b. N30°W/50°NE
c. S30°E/50°NE
d. N40°W/50°SW

7. _____ is a depressed hole in an outwash plain formed by retreating glaciers.

a. Kettle hole
b. Drumlin
c. Solution valley
d. Karst topography

8. The beds with gentle upstream dip (10-30°) indicates _____ for dams and reservoirs site selection.

a. not bad

b. unstable

c. ideal

d. unfavorable

9. P-wave travels at about _____ the velocity of S-wave.

a. 1.8 times

b. 1.15 times

c. 1.2 times

d. 1.3 times

10. Gravels should have compressive strengths in the range between _____.

a. 200-225 MPa

b. 150-200 MPa

c. 100-150 MPa

d. 50-100 MPa

Group "B"
[8 x 2 = 16 marks]

Attempt *ANY EIGHT* questions:

1. Discuss the elements for the site investigation of highway.
2. Explain the different criteria of recognition of fold in the field.
3. Calculate: TDA of the limestone bed due S50°E. Given: ADA = 1:15 due S20°W.
4. Illustrate the tectonic and physiographic division of Higher Himalaya.
5. Differentiate between weathering and erosion.
6. What is Moh's hardness scale. Tabulate the Moh's hardness scale.
7. Define engineering geology with reference to IAEG. What do you understand by sill and dyke.
8. Define Geological Time Scale. What is the significance of geological time scale?

9. Describe IUGS classification of igneous rocks.

Group "C"
[6 x 4 = 24 marks]

Attempt *ANY SIX* questions:

1. Discuss the geological agents and geological profile. Illustrate the landform produced by glacial in detail.
2. Describe the types of disaster on the basis of speed and cause. Explain the classification of fold in detail.
3. Differentiate between rock and mineral? Write down the types of metamorphism in detail.
4. Write down the specific properties, uses and engineering significances of granite, limestone, marble, slate, quartzite and hematite.
5. What are the structural discontinuities of rock? Describe it in detail. Give the Varnes'classification of mass movement and their causative factors of landslides.
6. Define Darcy's law. What are the sources of groundwater and how do you conserve the groundwater?
7. Discuss the types of reserve estimation method. If you are selected an engineering geologist in a project and requires to estimate the quantity of aggregates the river bar deposit for the construction. How do you plan to measure the sediment volume and estimate the reserve of the fluvial deposit? Give an example with suitable diagram and estimate the cost of the total reserve. Assume the cost of 1 ton of construction material/aggregate is NRs. 25,000, area of the deposit is 300,000 sq. m. and weighted density is 2,600 kg/m^3. The following table provides depths of deposits calculated from the site taking different profiles along E-W direction.

Profiles	Thickness (m)
P1-P2	4.5
P2-P3	7.5
P3-P4	5.5