

G-3/322/21

Roll No.....

III Semester Examination, April-2021

M.Sc.

GEOLOGY

Paper II

(Engineering Geology and Geotechnical
Investigation)

Time : 3 Hours]

[Maximum Marks : 80

Note : All questions are compulsory. Question Paper comprises of 3 sections. **Section A** is objective type/Multiple Choice questions with no internal choice. **Section B** is short answer type with internal choice. **Section C** is long answer type with internal choice.

SECTION 'A'

(Objective Type Questions)

Choose the correct answer :

1 × 10 = 10

1. The relationship of porosity and specific gravity of a rock is :

- (a) Low porosity rock have high specific gravity
- (b) High porosity rock have high specific gravity
- (c) No relation between porosity and permeability
- (d) Low porosity rock have low specific gravity

2. The maximum shear strain occurs on :

- (a) 90° with principle planes
- (b) 45° with principle planes
- (c) Principle plane
- (d) Independent of principle plane

P.T.O.

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3. High quality rock has an RQD (Rock quality designation) of :

- (a) 50% – 60% (b) More than 75%
- (c) Less than 50% (d) None of the above

4. The crushing strength of a building stone should be more than :

- (a) 500 kg/cm² (b) 1500 kg (cm²)
- (c) 1000 kg/cm² (d) 2000 kg (cm²)

5. The compressive strength of stone is found by :

- (a) Impact test (b) Crushing test
- (c) Hardness test (d) Attrition test

6. A dam in which entire force (acting on it) are transmitted to foundation rock and known as :

- (a) Arch Dam (b) Butress Dam
- (c) Gravity Dam (d) Earth Dam

7. Abutment is :

- (a) Upstream side of Dam
- (b) Downstream side of Dam
- (c) The sides of valley on which the structures rests
- (d) All of the above right

8. Construction of Tunnel is more safe :

- (a) Along axis of an anticline
- (b) Across the axis of an anticline
- (c) Along axis of syncline
- (d) Across axis of syncline

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Or

Discuss the methods of tunneling and support system.

5. Define landslides and its types, causes and effect. How can we prevent landslide problem ?

Or

Write notes on the following :

- (a) Earthquake Magnitude,
- (b) Geological investigation of a bridge site.

★ ★ ★ ★ ★ c ★ ★ ★ ★ ★

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9. Recently which Dam/Hydropower project has destroyed by glacial flood in India :

- (a) Sardar Sarovar Dam
- (b) Rishiganga Hydroelectric Project
- (c) Tungbhadra Dam
- (d) Idukki Dam

10. The bridge across the Hooghli River Calcutta is a :

- (a) Suspension Bridge (b) Cable stayed Bridge
- (c) Balanced captive Bridge
- (d) Level Bridge

SECTION 'B'

4 × 5 = 20

(Short Answer Type Questions)

Note : Answer the following questions in 250 words.

1. Write Engineering properties of Basalt and Limestone.

Or

Discuss the role of Engineering geologists in civil engineering project.

2. Write note on : (any one)

- (a) Rock mass classification,
- (b) Uses of concrete aggregates.

3. Discuss the geotechnical consideration of Dam construction.

Or

Write the types of spill ways and their path.

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4. Write geological consideration of tunnel construction in soft ground.

Or

Write comment on tunnels in inclined strata.

5. How many seismic zones are in India ?

Or

What are the major active forces on Bridges ? How to support the foundation of Bridges.

SECTION 'C'

10 × 5 = 50

(Long Answer Type Questions)

Note : Answer the following questions in 500 words.

1. Discuss the points that are incorporated in an engineering geology report by a geologist.

Or

What are the engineering properties of rocks ?

2. Discuss the properties of concrete aggregates.

Or

Define grouting. Write geotechnical methods and importance of grouting.

3. What are the forces acting on Dam ? Write foundation and abutment problems.

Or

Discuss the environmental impact on construction of reservoirs.

4. With a neat diagram give the different terminologies of Tunnel. Discuss the geological hazards in constructing tunnel in folded terrain.