

2017

GEOLOGY

(Major)

Paper : 6.3

(Environmental Geology and
Engineering Geology)

Full Marks : 60

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

1. Answer the following as directed : 1×7=7

(a) It is considered to be safe, if a tunnel is constructed parallel to the strike of the country rocks.

(Write True or False)

(b) The resistivity of which of the following rock types is the highest?

(i) Marl clays

(ii) Limestones

(iii) Sandstones

(iv) Crystalline rocks

(Choose the correct option)

(c) Which of the following is not considered during analysis of seismic forces acting on a dam?

- (i) Hydrostatic forces
- (ii) Hydrodynamic forces
- (iii) Forces due to vertical acceleration
- (iv) Forces due to horizontal acceleration

(Choose the correct option)

(d) Which of the following is not a landslide?

- (i) Fall
- (ii) Slump
- (iii) Earth flow
- (iv) Avalanche

(Choose the correct option)

(e) Which one of the following is true for the geologic effects of earthquakes?

- (i) Landslides
- (ii) Liquefaction
- (iii) Fault rupture
- (iv) All of the above

(Choose the correct option)

(f) Which of the following can cause soil pollution?

- (i) Heavy metals
- (ii) Magnesium
- (iii) Sodium
- (iv) Copper

(Choose the correct option)

(3)

(g) Photochemical oxidants constitute one of the various principal pollutants that can pollute air, water and land.

(Write True or False)

2. Answer the following briefly : 2×4=8

(a) What is bearing capacity of soil?

(b) What is solifluction?

(c) What is seismic vulnerability?

(d) What is palaeoseismicity?

3. Answer any *three* of the following : 5×3=15

(a) What is grouting? Explain briefly the various types of grouting.

(b) Describe any five engineering properties of soils.

(c) Write briefly on the various foundation and abutment problems that may be encountered in a dam site.

(d) Write briefly on the impact of landslides on environment.

(e) Elaborate on the scope of Environmental Geology.

(f) What is environmental pollution? Explain with suitable examples from India.

4. Answer any *three* of the following : 10×3=30

- (a) Elaborate on the various seismic hazard assessment parameters.
- (b) Discuss the impacts of mining on the environment. Write briefly on acid mining drainage.
- (c) What do you understand by the terms natural and anthropogenic environmental hazards? Explain with suitable examples.
- (d) How are electrical methods of geophysical investigation carried out? Explain with illustrations.
- (e) Describe the various geological factors that are considered during the construction of tunnels.
- (f) Define the term landslide. Elaborate on the various causes responsible for landslides.

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