

2018

**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 :  $1 \times 7 = 7$

(a) The primary cause of anthropogenic hazards is

(i) animal activity

(ii) natural forces

(iii) human activity

(iv) None of the above

(Choose the correct option)

(b) Strip mining accounts for about 40% of the world coal mines.

(Write True or False)

(c) Which of the following most important forces is acting on a dam?

(i) The dam's own weight

(ii) Hydrostatic pressure

(iii) Both (i) and (ii)

(iv) None of the above

(Choose the correct option)

(d) The cost and stability of a tunnelling project is closely interlinked with

(i) selection of tunnel route

(ii) selection of excavation method

(iii) selection of tunnel design

(iv) All of the above

(Choose the correct option)

(e) In which of the following types of mass movements, the surface of failure is generally planar?

(i) Translational slides

(ii) Rotational slides

(iii) Rock falls

(iv) None of the above

(Choose the correct option)

(f) Narrow valleys with strong abutments are best suitable for \_\_\_\_\_ dams.

(Fill in the blank)

(g) In which of the following rock pairs, the value of porosity is almost equal?

(i) Sandstones and limestones

(ii) Granites and quartzites

(iii) Both (i) and (ii)

(iv) None of the above

(Choose the correct option)

2. Answer the following in brief : 2×4=8

(a) What is liquefaction?

(b) State the difference between slump and earth flow.

(c) What is reservoir-induced seismicity?

(d) Define any one abutment problem of a dam.

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

(a) Briefly explain five effective methods to combat environmental pollution in India.

(b) What are flash floods? How can they be regulated?

(c) What is the scope of environmental geology in the present-day context?

- (d) What is grouting? Outline briefly the various materials that are used in the grouting process.
- (e) Explain briefly any three engineering properties of soils.

4. Answer any *three* of the following :  $10 \times 3 = 30$

- (a) Describe in detail the various forms of natural environmental hazards.
- (b) Elaborate on the various seismic hazard assessment parameters.
- (c) What do you mean by the term 'flood'? Describe the impact of floods on environment.
- (d) Differentiate between dam foundation and abutment. Describe the various problems associated with these two.
- (e) What do you understand by the term 'landslide'? Describe the various measures that are popularly adopted to mitigate the landslide phenomena.
- (f) Outline the various geophysical investigation methods which are undertaken in dam site.

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