ENGINEERING GEOLOGY
(CIVL 2104)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) Conglomerate and breccia are
(a) igneous rock (b) sedimentary rock
(c) metamorphic rock (d) all of the above.

(ii) The softest mineral known as per Mohr's scale is
(a) quartz (b) orthoclase
(c) talc (d) calcite.

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(a) quartz (b) orthoclase
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(iv) An isometric or cubic system has _____ planes of symmetry.
(a) 6 (b) 9 (c) 3 (d) none of these

(v) Which of the following rocks is the most desirable at dam site?
(a) Granites, syenites or diorites (b) Shales
(c) Laterites (d) Schists.

(vi) The mean radius of the earth is
(a) 6171 km (b) 6271 km
(c) 6371 km (d) 6471 km.

(vii) Granite is
(a) a basic igneous rock (b) an intermediate igneous rock
(c) an acid igneous rock (d) an ultrabasic igneous rock.

(viii) S-wave does not pass through
(a) sedimentary rock (b) ore bodies
(c) liquid (d) solidified igneous masses.

(ix) Resistivity of crystalline igneous rocks is generally in the range of
(a) 10^2 ohm-metres (b) less than 10 ohm-metres
(c) 10^5 ohm-metres and above (d) none of these.

(x) Equigranular textures are often named as
(a) granitic texture (b) anhedral texture
(c) euhedral texture (d) subhedral texture.

Group – B

2. Define 'Crystal' and 'Mineral'. How would you systematically describe and identify minerals in hand specimen? Cite common examples. **(4 + 8) = 12**

3. (a) Name the physical properties of minerals that may be needed for their identification.

(b) Name the minerals which have flaky, fibrous, pisolitic and granular forms.

(c) What is streak? Discuss its importance in identification of minerals. **4 + 4 + 4 = 12**

Group – C

4. Define a fault structure and also give a comprehensive classification of fault. **(3 + 9) = 12**

5. Define fold and discuss different parts of a folded layer. Write a note on engineering consideration of fold structures in rock. **(7 + 5) = 12**

Group – D

6. (a) Give an account of important factors to be considered for evolving a seismic designs in a seismic region.

(b) Differentiate between intensity and magnitude of an earthquake. **8 + 4 = 12**

7. (a) What are the major causes of earthquakes? How are earthquake waves useful in deciphering the interior of the earth?

(b) Write briefly on the nature of precautions required in major constructions in earthquake-prone regions. **8 + 4 = 12**

Group – E

8. (a) Write briefly on the principle of electrical receptivity method in geophysical investigation. Comment an interpretation on receptivity data.

   (b) Write briefly on geological studies for selection of tunnel sites.

7 + 5 = 12

9. (a) Write a note on geological investigation for reservoir site selection.

   (b) How structural geological and engineering properties of rock influence dam site selection?

5 + 7 = 12