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) Phosphatic mineral in the Moh's scale of hardness is
(a) fluorite (b) apatite
(c) corundum (d) topaz.

(ii) Streak of a mineral is
(a) tendency to split along certain direction yielding smooth surfaces
(b) appearance on a broken surface of a mineral
(c) colour of the powder of a mineral
(d) colour of the mineral.

(iii) In Strike Fault the strike of the fault plane is
(a) parallel to the dip direction of fault
(b) parallel to the strike direction of fault
(c) oblique to the strike direction of fault
(d) none of these.

(iv) If S-wave were to pass from a solid to liquid stratum, what would happen to its velocity?
(a) Stay the same (b) Increase
(c) Decrease to zero (d) Cannot be ascertained.

(v) Petroleum can be suitably explored by
(a) magnetic method (b) ground penetrating radar
(c) seismic method (d) resistivity method.

(vi) The most stable mineral to weathering is
(a) Feldspar (b) Olivine
(c) Quartz (d) Haematite.

(vii) Which of the following list of rocks is written in order of decreasing grain size?
(a) Sandstone, siltstone, conglomerate
(b) Sandstone, conglomerate, siltstone
(c) Conglomerate, sandstone, siltstone
(d) Siltstone, sandstone, conglomerate.

(viii) The example of an intrusive igneous rocks is
(a) basalt (b) granite
(c) rhyolite (d) andesite.

(ix) An example of foliated metamorphic rock is
(a) Shale (b) Amphibolites
(c) Schist (d) Slate.

(x) In Recumbent fold the axial surface is
(a) curve (b) vertical
(c) inclined (d) horizontal.

Group – B

2. (a) What is Hardness of a mineral? Why is it considered as a vector property of a mineral? What are the factors on which hardness of a mineral depend?

(b) What is "Form" of a mineral? Give two important forms with mineral examples. What is cleavage?

(2 + 2 + 2) + (2 + 2 + 2) = 12

3. (a) Classify sedimentary rocks on the basis of their textures? Describe their salient features.

(b) Give short notes on ***(any two)***:
(i) Ox-Bow lake
(ii) Love wave
(iii) Phacolith.

(3 + 3) + (3 + 3) = 12

Group – C

4. (a) What is the difference between weathering and erosion? Give short notes on any one physical and one chemical weathering.

(b) What do you mean by attitude of an inclined surface? Explain with diagram.

(2 + 4) + (3 + 3) = 12

5. (a) What is Antiformal syncline? Classify folds on the basis of direction of closure of folds.

   (b) What is a fault? Classify the fault on the basis of net slip directions with diagrams.

(2 + 4) + (2 + 4) = 12

Group – D

6. (a) What is effective porosity of rocks? On what factors the porosity of a rock depend? How porosity of rocks can be measured?

   (b) What is tensile strength of a rock? How is it determined in laboratory?

(2 + 2 + 2) + (2 + 4) = 12

7. (a) What is Hypocenter of an earthquake? Mention important measures necessary for any large scale civil engineering constructions in an earthquake prone area.

   (b) Mention the qualities which are important for rocks to be considered as good building stone.

(1 + 5) + 6 = 12

Group – E

8. (a) What is resistivity sounding? Give the Schlumberger electrode configuration and explain briefly the sounding method.

   (b) Explain how the field resistivity data are interpreted.

(2 + 4) + 6 = 12

9. (a) What is Landslide? Discuss briefly about the causes and prevention of landslides.

   (b) What is an Earth Dam? What geological studies are necessary for the selection of dam site?

(2 + 4) + (2 + 4) = 12