B.Tech/CE/3rd Sem/CIVL-2104/2015

2015

ENGINEERING GEOLOGY

(CIVL 2104)

Time Alloted : 3 Hours *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 alternatives for the following : **[10×1=10]**

   i) Mohorovicic discontinuity

   (a) separates crust and the core
   (b) separates crust and the mantle
   (c) separates mantle from the core
   (d) separates mantle from the inner core

   ii) The hardest oxide mineral in the Moh's scale of hardness is

   (a) topaz (b) diamond
   (c) corundum (d) quartz

   iii) Seismograph is

   (a) an instrument to measure the depth of focus of earthquake
   (b) an instrument to measure the magnitude of earthquake
   (c) the graph of the isoseismal lines of an earthquake
   (d) the graph of earthquake waves

   iv) The direction along which a mineral tends to break is called

   (a) form (b) fracture
   (c) cleavage (d) none of these

   v) 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.

   vi) Other things being same, turned alignments are safe in a sound layered rock when these run

   (a) parallel to the dip direction.
   (b) parallel to the strike direction.
   (c) oblique to the strike direction.
   (d) none of these.

   vii) The least stable mineral to weathering is

   (a) Feldspar (b) Pyroxene
   (c) Quartz (d) Haematite

viii) 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) Silstone, sandstone, conglomerate

ix) The concordant structure in igneous rocks is

(a) Sill (b) dyke
(c) ring dyke (d) batholith

x) An important foundation rock is

(a) Shale (b) Amphibolites
(c) Quartzite (d) Sandstone

GROUP - B

2. (a) What is hardness of a mineral? How is it measured? What is Mohs scale of hardness?

(b) What is "Lusture" of a mineral? Describe briefly the different lustures of mineral with examples.

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

3. (a) What are intrusive and extrusive igneous rocks? Describe their salient features.

(b) Write short notes on any two :

(i) Laccolith, (ii) Batholith, (iii) Clastic sedimentary rocks, (iv) Schist rocks. **(3+3)+(3+3) = 12**

GROUP - C

4. (a) Define true dip and apparent dip. The true dip of a rock is 20° along south 30° west. Find the apparent dip of the rock bed along south 25° east. Draw the neat sketch.

(b) Define a fault. Draw a diagram to show the hanging wall, footwall, heave and through of a fault.

(2+4)+(1+5) = 12

5. (a) Discuss about different transportation and depositional features of river with neat sketches.

(b) What is soil and soil profile? Explain how climate, rock types, topography, organism and time influence the type of soil produced by weathering. **(3+3)+(2+4) = 12**

Group - D

6. (a) Distinguish between P waves and S waves. What do you mean by the term intensity and magnitude of an earthquake?

(b) Describe the method for determining earthquake epicentre. **(3+4)+5 = 12**

7. (a) What do you mean by porosity and permeability of a rock? What are the factors that control the porosity of rock?

(b) What are building stone and road materials? What are the different properties that you have to consider for the selection of building stone and road materials?

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

GROUP - E

8. (a) What is resistivity sounding? Give the Schlumberger electrode configuration and explain briefly how the resistivity data are represented.

(b) Give a neat sketch to show the components of a dam.What are the geological studies needed for the selection of a dam site? **(2+4)+(3+3) = 12**

9. (a) How structural, geological and engineering properties of rock influence the selection of dam sites?

(b) What is landslide? How landslide can be mitigated in hilly region? **6+(2+4) = 12**