# BACHELOR OF ENGINEERING IN CIVIL ENGINEERING

## SUPPLEMENTARY EXAMINATION, 2018

### (2nd Year, 1st Semester)

### ENGINEERING GEOLOGY

Time: Three hours                                                                 Full Marks: 100

#### (50 marks for each group)

#### Use a separate Answer-Script for each group

### GROUP – A

**Answer any five (05) questions from the following**

1. What are the major stages of a civil engineering project? Discuss the role of geological sciences in those different stages of a project. What is in the importance of lithological map of a particular area?                                                   (3+5+2 = 10)

2. How does hardness of a rock differ from its toughness? What is 'abrasive resistance'? Describe the 'Los Angeles' test in brief.                                        (3+2+5 = 10)

3. What is meant by 'Bulk density of soil'? How it is measured in the field for cohesive soil and non cohesive loose soil? – explain both in brief. What is compaction? What is 'O.M.C' of cohesive soil?                                                   (2+5+2+1 = 10)

4. What are the 'void ratio' and 'porosity' of a porous media? Derive is the relation between 'void ratio' and 'porosity'. What is meant by the term 'hydraulic gradient? How it affect the flow of a liquid through porous media?                                        (4+2+2+2 = 10)

5. A sample of rock has a porosity of 40%. The specific gravity of the solid grains is 2.60. Calculate (a) Void ratio, (b) Dry density, (c) Unit weight of the rock if that is 50% saturated.                                                                 (2+3+5= 10)

6. Distinguish between Creep and 'Solifluction'? Present a flow chart mentioning the natural causative factors of landslide. Describe on major preventive measures for slope instability.                                                             (3+4+3 = 10)

7. Describe the different types of seismic waves those are generated during an earthquake? Which are the waves those are responsible for earthquake disaster? What is focus and epicentre? How may earthquake zones are there in India? Kolkata city falls in which zone?                                                                 (4+1+3+1+1 = 10)

8. Fill up the blanks with appropriate word (s) / term (s)                            (10×1 = 10)

   a. Unconformities help to determine the relative _____ of rock layers

   b. Half-life of Thorium ($^{230}$Th) is _____ than that of Half-life of carbon ($^{14}$C)

c. Layer _____ of continental crust is mainly made up of granites and gneisses.

d. 4.25 mm sieve is generally used to differentiate the size between sand and _____

e. Increasing the soil density by decreasing its voids is termed as _____

f. _____ dam is generally constructed on steeply dipping narrow river with a strong rocky side wall.

g. Fossils lived for long periods of time are called as _____ fossils.

h. The unit of 'absolute permeability' is _____

i. The saturated band of soil above groundwater table is called _____ fringe.

j. Diagenesis is the process of formation of _____ rock.

# B.E.CIVIL ENGG. 2<sup>ND</sup> YEAR 1<sup>ST</sup> SEM. SUPPLEMENTARY EXAM., 2018

**Subject: Engineering Geology**         **Time: 3 Hours**         **Full Marks: 100**

GROUP - B

**(Use Separate Answer scripts for each Part)**

<u>Answer any 5 (five) questions from Part – II :</u>                    10x5=50

1.  Discuss about the Structure of the Earth's Interior by
    Depth vs. Velocity diagram of earthquake waves.                    10

2.  Describe the characters of different earthquake waves.             8+2=10
    What is a seismograph?

3.  Briefly describe the optical properties of minerals.               2+8=10

4.  Define reservoir. What are the Geological controls that should
    be taken care of during construction of a stable dam?
    Explain with sketches.                                             2+8=10

5.  Discuss with neat diagrams about the orientation of basement
    rocks for a stable Dam.                                            10

6.  What is crystal symmetry? Discuss briefly about the Symmetry
    Elements of a crystal.                                             2+8=10

7.  Define rock. Discuss about the genesis of any Metamorphic rock.    2+8=10

8.  Describe the problems related to the construction of a Road along
    Hill-slope. How will you protect the Hill-cut Road which is constructed
    on fractured or sheared zone?                                      5+5=10

9.  What is APWP? Describe the characters of divergent plate
    boundary.                                                          2+8=10