

Total No. of printed pages = 3

CE 181404

Roll No. of candidate

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2023

B.Tech. 4th Semester End-Term Examination

Civil Engineering

ENGINEERING GEOLOGY

New Regulation (w.e.f. 2017-18) & New Syllabus (w.e.f. 2018-19)

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks
for the questions.

Answer question No. 1 and any *four* from the rest.

1. Answer the following : (MCQ / Fill in the blanks) (10 × 1 = 10)
- (i) Which of the following minerals has the highest hardness?
- (a) Talc (b) Quartz
(c) Fluorite (d) Calcite
- (ii) Mineralogical composition of granite is
- (a) Quartz, feldspar and biotite
(b) Quartz, hornblende and biotite
(c) Feldspar, hornblende and olivine
(d) Quartz, biotite and tourmaline
- (iii) Clastic rock is formed from
- (a) Lithification of the transported grains
(b) Evaporation of sea water
(c) Transformation by heat
(d) Transformation by pressure

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- (iv) Repetition of beds on a geological map may be due to
(a) folding (b) faulting
(c) unconformity (d) disconformity
- (v) Ox-bow lake is produced by action of
(a) river (b) glacier
(c) wind (d) glacier and river
- (vi) Landslides mostly occur during
(a) pre-monsoon (b) post-monsoon
(c) monsoon (d) summer
- (vii) If any rock has RQD of 40%, it will be classified as
(a) Excellent (b) Good
(c) Very good (d) Poor
- (viii) Granite is mostly used in:
(a) Building (b) Flooring
(c) Foundation (d) Both building and flooring
- (ix) Which of the following components are found in a dam?
(a) Axis, toe and crest
(b) Tower, piers and abutments
(c) Axis, limb and crest
(d) Limb, saddle and reef
- (x) The point on the Earth's surface vertically above the focus is known as
(a) hypocentre (b) epicentre
(c) isoseismals (d) none of the above

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2. (a) What do you understand by weathering? (3 + 2 + 10 = 15)
(b) Name the important processes of weathering.
(c) Describe the major types of Mechanical (Physical) weathering.
3. (a) Describe the stages of a river system along with the characteristics and features found in each of the stages. Draw sketches to explain the features. (9 + 6 = 15)
(b) What are the fundamental types of dunes? Describe briefly.

4. (a) Mention three characteristic physical properties and one of its uses of any five of the following minerals : (5 × 2 = 10)
- (i) Orthoclase
 - (ii) Albite
 - (iii) Muscovite
 - (iv) Calcite
 - (v) Quartz
 - (vi) Enstatite
 - (vii) Microcline.
- (b) Mention two engineering properties of the following rocks : (1 × 5 = 5)
- (i) Gneiss
 - (ii) Sandstone
 - (iii) Quartzite
 - (iv) Granite
 - (v) Basalt.
5. (a) What do you understand by geomechanical properties of rocks? (2 + 8 = 10)
- (b) Describe briefly the geomechanical properties of different rocks which are required for carrying out the geological investigation for civil engineering structures.
- (c) Define Rock Quality Designation(RQD) and classify the rocks based on RQD. (2 + 3 = 5)
6. (a) What are the suitable geological strata for a concrete gravity dam? (5 + 10 = 15)
- (b) Describe the suitability of a dam in a folded and faulted region.
7. Write short notes on any *three* of the following :
- (a) Anticline and Syncline
 - (b) Direct and indirect effects of earthquakes
 - (c) Seismic refraction method
 - (d) Seismic zonation of India
 - (e) Landslide hazard mitigation
 - (f) Normal and reverse fault.

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