

B. CIVIL ENGG. (EVENING)1st YEAR 1st SEM. SUPPLEMENTARY EXAM. 2023

Subject: ENGINEERING GEOLOGY.

Time: 3 Hours.

Full Marks: 100

Answer Question No. 1 and any Five (5) from the rest:

{20+ (5 x 16)} = 100

1. Write "True" or "False" :

1 x 20 = 20

- i) Quartz is a sedimentary rock.
- ii) R-wave can only pass through the liquid medium.
- iii) Antiform is the fold which closes upward.
- iv) Calcite is harder than Topaz.
- v) 8-Fold axis of symmetry exists in nature.
- vi) Net-slip is measured along dip direction in normal fault.
- vii) The crust-mantle boundary is demarcated by "Moho-discontinuity".
- viii) Petrology deals with study of rock.
- ix) 6-Fold symmetry is equivalent to none-symmetry.
- x) Clay is more harder than mud layer.
- xi) Sill is a discordant structure of intrusive sedimentary rock.
- xii) Trigonal System consists of three crystallographic axes.
- xiii) Cleavage and fracture planes are equivalent in mineral.
- xiv) Aquifers are non-porous and non-permeable medium.
- xv) "Zone of aeration" must be saturated with air.
- xvi) Love waves propagate through the interior of earth.
- xvii) Quartz naturally shows at least three sets of perfect cleavage.
- xviii) Dip is the angle between inclined and horizontal planes.
- xix) Effluent rivers recharge the surface water.
- xx) Lustre is colour of dust of any mineral.

- 2. a) Describe with neat sketch the Internal Structure of the Earth using Depth vs. Velocity diagram of seismic waves. 10
- b) Discuss about the characters of different earthquake waves. 6
- 3. a) Discuss the different physical properties by which you can identify minerals in nature. 8
- b) Define mineral and crystal. Discuss the Crystal Systems on the basis of their axial ratios and inter-axial angle 8
- 4. a) Attempt a Classification of Fold on the Basis of Dip isogons and Orthogonal thickness. Draw neat sketches of these folds. 8
- b) Define Reverse Fault. How do you identify a faulted structure in vertical rock section? Draw neat sketches of Oblique-slip fault. 8

[Turn over

- | | | |
|----|---|------------|
| 5. | a) Define Dam and Reservoir. What are the Geological factors that should be taken care of during construction of a stable dam? Explain with diagram. | 10 |
| | b) Discuss with neat sketches about the orientation of basement rocks of a suitable Dam. | 6 |
| 6. | a) Define rock. What are the different types of rock found in nature? How the metamorphic rocks are formed in nature? | 10 |
| | b) What is Dyke? What is the basic difference between Sill and Dyke? Define Igneous Rock with example. | 6 |
| 7. | a) Discuss the problem of construction of a Tunnel across any faulted and foliated sub-surface zone. Explain with suitable diagram. | 8 |
| | b) What are geological factors that should be taken care of during construction of a Bridge across any natural depression? Explain with suitable diagram. | 8 |
| 8. | a) Discuss the problem of construction of a Road along Hill-slope. How will you protect the Hill-cut Road which is constructed on foliated or sheared zone? | 10 |
| | b) What is hydraulic conductivity and discuss its importance in Engineering Geology? | 6 |
| 9. | <u>Write short notes: (any Four)</u> | 4 x 4 = 16 |
| | a) Engineering Geology, | |
| | b) Ground Water Table, | |
| | c) Darcy's Law, | |
| | d) Saline Water Intrusion, | |
| | e) Moh's Scale of Hardness, | |
| | f) Elements of Symmetry. | |