

B. E. CIVIL ENGG. (EVENING) 1st YEAR 1st SEM. Examination, 2025

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) Schist is a sedimentary rock.
- ii) S-wave can only pass through the Interior of Earth.
- iii) Anti-form is the fold which closes upward.
- iv) Topaz is harder than Calcite.
- v) 6-Fold axis of symmetry exists in nature.
- vi) Net-slip is measured along Dip direction in Dip-slip fault.
- vii) The core-mantle boundary is demarcated by "Moho-discontinuity".
- viii) Petrology deals with study of oil.
- ix) "None" symmetry is equivalent to 2-Fold Axis of symmetry.
- x) Crest is highest point of any faulted layer.
- xi) Dip is the angle between inclined and horizontal planes.
- xii) Hexagonal System consists of six crystallographic axes.
- xiii) Joint and fracture planes are not equivalent in rock.
- xiv) R- waves propagate through the interior of the earth.
- xv) "m" is equivalent to plane of symmetry.
- xvi) P-waves propagate along the outer surface of earth.
- xvii) Calcite naturally shows three sets of perfect cleavage.
- xviii) In monoclinic system, $a = b = c$ and $\alpha \neq \beta \neq \gamma$.
- xix) Effluent rivers recharge the ground water.
- xx) Lustre is colour of powder of any mineral.

2. a) Discuss about the Internal structure of Earth, with neat sketch using Depth vs. Velocity diagram of earthquake waves. 10
- b) Describe the natures of different earthquake waves. 6
3. a) Discuss the different Physical properties by which you can identify minerals in nature. 10
- b) Discuss the Hexagonal and Cubic systems on the basis of their axial ratios and inter-axial angle with suitable sketch. 6
4. a) Attempt a Classification of Fold on the Basis of Ramsay classification. Draw neat sketches of these folds. What is Dip Isogon? 8
- b) What is Reverse Fault? How do you identify a faulted structure in vertical rock section? Draw neat sketches of oblique - slip fault. 8

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5. a) Define Dam and Reservoir. What are the Geological controls that should be taken care of during construction of a safe and stable dam? Explain with diagram. 8
- b) Discuss with neat sketches about the basement orientation of rocks for a suitable and safe Dam. 8
6. a) Define sedimentary rock. What are the different types of rock found in crust? How the Igneous rocks are formed in nature? 10
- b) What is sill? What is the basic difference between Granite and Granulite? Define Metamorphic Rock with example. 6
7. a) Discuss the problem of construction of a Tunnel across any folded and sheared 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 river channel? Explain with suitable diagram. 8
8. a) Describe the Engineering problem for construction of a Road along Hill-slope. How will you protect the Hill-cut Road which is constructed on a land slide prone zone? 8
- b) What is Ground Water Table? How will you protect saline water intrusion? 8
9. **Write short notes on (any Four):** 4 x 4 = 16
 - a) Monoclinic System,
 - b) Symmetry,
 - c) Lustre of mineral,
 - d) Extinction Angle,
 - e) Moh's Scale of Hardness,
 - f) Refractive Indices (R.I.).