0304N38

Candidate's Seat No : _____

M.Sc Semester-4 Examination

508

Geology

Time : 2-30 Hours] April-2024 [Max. Marks : 70

Instructions: (i) Draw neat diagrams whenever necessary.
(ii) Write proper answer number.

Q-1. How does seismic activity affect the stability of structures and how can it be mitigated in engineering design? **(14)**

OR

Q-1. (a) How do geotechnical engineers assess the risk of landslides in a given area? **(07)**

(b) The important "Engineering Rock Mass" classifications and their uses. **(07)**

Q-2. How does geology impact the design and construction of tunnels and underground structures? **(14)**

OR

Q-2. (a) The significance of soil classification and testing in engineering geology. **(07)**

(b) Enumerate different causes of dam failures. **(07)**

Q-3. Discuss the regulatory frameworks and international agreements governing the exploration and exploitation of polymetallic nodules. **(14)**

OR

Q-3. (a) Ocean morphology. **(07)**

(b) Oceanic sediments and distribution of marine microfossils. **(07)**

Q-4. Explain statistics and trigonometric functions are used in solving the geological problems. **(14)**

OR

Q-4. (a) Three adjacent faults have throws and dips as follows:
(1) $10\ m\ at\ 60^\circ$ (2) $5\ m\ at\ 65^\circ$ (3) $12\ m\ at\ 45^\circ$ draw the figure and calculate the total slip vector and total dip angle of block 1 relative to block 4. **(07)**

(b) Discus procedure of testing of hypothesis and define type I and type II errors. **(07)**

Q-5. **Attempt any seven questions out of twelve.** **(14)**

(i) What factors influence slope stability in engineering geology?

(ii) Mention the role of geological surveys in site engineering projects.

(iii) What are the primary objectives of seismic design in buildings?

(iv) Draw a labelled sketch of tunnel parallel to faulting.

(v) Name two geotechnical aspects of rock stress.

(vi) Define grouting and anchoring with suitable examples.

(vii) Mention two deep sea/ocean topographic features with examples.

(viii) What are the main functions of the International Seabed Authority?

(ix) How do polymetallic nodules form and what are their main constituents?

(x) Write Pythagoras formula for right-angle triangle.

(xi) Define any one measure of variation and level of significance.

(xii) Find the integration of $\tan(x)$ and the derivative of $y = 3\,x\sin(x)$.

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