2024/SEM/EVEN/14/36/ESC/ESCC-553/107

PG Even Semester Exam, 2024

Earth Science

2nd Semester

COURSE NO. ESCC- 553

[Hydrogeology and Advanced Sedimentology]

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer five questions, taking one from each Unit

UNIT-I

1. a. Illustrate the hydrological cycle. Write the genetic classification of ground water. 4+3=7

   b. Write briefly on: 3+4=7

      i. Hydrological budget for groundwater system

      ii. Perched and leaky aquifers

2. a. Define piejometric surface. Discuss the relationship between porosity and void ratio of an unconsolidated clay sample. 2+3=5

Turn over

   b. Discuss the following: 4+5=9

      i. Validity of Darcy's law

      ii. Determination of hydraulic conductivity using constant head permeameter method.

UNIT-II

3. Give a detailed account on the occurrence of groundwater in arid, semi-arid, coastal and

alluvial regions with reference to the Indian subcontinent. 14

4. a. Derive the Ghyben-Harzberg equation for fresh and saline water using neat sketches. 8

   b. Write notes on the following: 3x2=6

      i. Development of groundwater well

      ii. Types of well casing

UNIT-III

5. Write short note on the following: 5+5+4=14

   a. Lagoon

   b. Wave derminated estuary

   c. Continental facies

6. a. What is alluvial fan? Write the characteristic deposit of alluvial fan with neat sketch. 1+6=7

   b. Write descriptive note on meandering river deposit. 7

UNIT-IV

7. a. How porosity can be destroyed via diagenesis? 7

   b. Write a descriptive note on different carbonate minerals. 7

8. a. Give an explanatory note on role of fluid on diagenesis. 7

   b. Write a descriptive note on uses of heavy minerals and its limitation. 7

UNIT-V

9. a. What is the significance of cyclic sedimentation in basin analysis? 5

   b. Write a note on continental carbonate deposit. 5

   c. Write short note on sabkha deposit. 4

10. a. Write a descriptive note on volanoclastic sediment. 8

    b. Write a note on the significance of ichnofacies study. 6

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