PG Even Semester Exam, May 2025

Earth Science

4th Semester

COURSE NO. ESCC-651

[Structural Geology (II) and Indian Stratigraphy]

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. Explain the difference between: 9
   i. Stress and strain
   ii. Normal stress and shear stress
   iii. Mean stress and deviatoric stress
   b. How do compression, tension, and shear differ from one another? 5
2. a. Derive expressions for normal and shear stress for an inclined plane. Draw Mohr's circle of stress and outline its significance. 6+4=10

b. Write Short note on the following: 2+2=4
   i. Homogeneous Strain
   ii. Quadratic elongation

UNIT-II

3. a. Discuss the different types of lineation that develop under plastic deformation and in the brittle regime, with the help of suitable examples and diagrams. 10

   b. What is the difference between crenulation lineation and intersection lineation? 2+2=4

4. Write Short note on the following: 6+4+4=14

   a. Mylonites and Cataclasites

   b. Shear zone and its types

   c. Mica fish and S-C structures

UNIT-III

5. Discuss the various tectonic characteristics of Precambrian orogenic belts in India. Also discuss the different types of plate boundaries. 10+4=14

6. a. Write in detail a note on anatomy of orogenic belt. 8

   b. Discuss the dynamic evolution of continental and oceanic crust. 6

UNIT-IV

7. a. What is Purana Basin? Give an example of Purana Basin. Write a note on the paleogeography of Vindhyan basin. 1+1+5=7

   b. Write the stratigraphy of Aravalli craton. Add a note on the lineaments of Aravalli craton. 4+3=7

8. Enumerate the principle lithological units of Singhbhum craton. Write the stratigraphy of Singbhum craton. Write the lithological characteristics of of Singhbhum craton. Describe the intraplate subduction theory of Singhbhum orogeny. 2+4+3+5=14

UNIT-V

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

   a. Talchir Formation

   b. Muth Formation

   c. Uttatur Group

10. a. Enumerate the formations deposited in Eocene of Kutch basin. Write a descriptive note on any one of these formations. 2+5=7

    b. Write descriptive note on Shella Formation of Assam basin. 7

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