2022

(November)

GEOLOGY

(Elective/Honours)

(GELH-301)

(Structural Geology and Geotectonics)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, selecting **one** from each Unit

UNIT—I

(Introduction to Structural Geology and Folds)

1. *(a)* Define the terms with which you measure the attitude of lines and planes in rocks. Draw suitable sketches. 4+1=5

(b) Explain Ramsay's classification of folds based on dip isogons. Draw sketches. 8+1=9

2. *(a)* Explain how the nature of major folds can be determined from minor folds. 8

(b) Write short notes on any *two* of the following : 3×2=6

(i) Asymmetrical folds

(ii) Use of cross-bedding in structural geology

(iii) Angular unconformity and disconformity

(iv) Chevron folds and kink bands

UNIT—II

(Fault, Foliation and Lineation)

3. *(a)* Define the basic elements of faults. 5

(b) Write short notes on any *three* of the following : 3×3=9

(i) Domainal structure of rock cleavage

(ii) Mineral lineation

(iii) Slaty cleavage and schistosity

(iv) Mechanism of faulting

(v) Concept of foliation

4. *(a)* Write brief notes on the types of disjunctive foliation and crenulation foliation. 4+4=8

(b) Write short notes on any *two* of the following : 3×2=6

(i) Ramps and flats

(ii) Boudin

(iii) Joints in fault zone and folds

(iv) Influence of fluid pressure on faults

UNIT—III

(Rock Deformation)

5. *(a)* Define stress. Determine trigonometrically the normal stress and shear stress for a stress acting at an angle θ on a plane. What is a stress ellipse? 1+3+2=6

(b) Explain the components of stress acting at a point in a rock. What is a second rank tensor? 7+1=8

6. *(a)* Explain the strain behaviour of rocks under varying confining pressure and fluid pressure. 5

(b) Write short notes on any *three* of the following : 3×3=9

(i) Longitudinal strain and quadratic elongation

(ii) Angular strain

(iii) Rotational and irrotational strain

(iv) Stress equations

(iv) Coaxial strain

UNIT—IV

(Geotectonics)

7. *(a)* Explain the concept of continental drift. 5

(b) Describe the tectonic settings and geodynamics when two plates collide. Draw suitable sketches. 9

8. *(a)* Explain the causes of plate motion. 5

(b) Write short notes on any *three* of the following : 3×3=9

(i) Rift valley

(ii) Transform faults

(iii) Evolution of ocean basins

(iv) Palaeontological evidences of continental drift

(v) Gondwanaland

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