

2018

GEOLOGY

( Major )

Paper : 3.1 (Theory)

( **Structural Geology and Geotectonics** )

Full Marks : 60

Time : 3 hours

*The figures in the margin indicate full marks  
for the questions*

1. Choose the correct answer from the following : 1×7=7

(a) The shearing stress is denoted by

(i)  $\sigma$  (sigma)

(ii)  $\rho$  (rho)

(iii)  $\phi$  (phi)

(iv)  $\tau$  (tau)

(b) The true dip direction of a bed is N 30° W, the strike direction of that will

(i) S 30° E

(ii) S 30° W

(iii) N 60° E

(iv) S 60° E



(c) Most folding is caused by what type of tectonic forces?

- (i) Compressive forces
- (ii) Tensional forces
- (iii) Shearing forces
- (iv) Tectonic forces

(d) The outline of columnar joints may be

- (i) triangular
- (ii) square
- (iii) hexagonal
- (iv) Either of the above

(e) Reverse faults result when

- (i) maximum stress ( $\sigma_1$ ) is vertical
- (ii) mean stress ( $\sigma_2$ ) is vertical
- (iii) minimum stress ( $\sigma_3$ ) is vertical
- (iv) maximum and mean stresses are vertical

(f) The parallelism of some directional properties in the rock is known as

- (i) foliation
- (ii) lineation
- (iii) cleavage
- (iv) bedding

(g) Dauki fault is a

- (i) high-angle thrust fault
- (ii) low-angle thrust fault
- (iii) normal fault
- (iv) graben and horst structure

2. Write on any *four* of the following : 2×4=8

- (a) Penecontemporaneous structure
- (b) Pure shear and simple shear
- (c) Crenulation foliation
- (d) Detachment fault
- (e) Transform fault

3. Write on any *three* of the following : 5×3=15

- (a) Mohr's stress circle
- (b) Ramsay's classification of folded layers
- (c) Boudinage and mullion structure
- (d) Hot spots and mantle plumes



4. What is geosyncline? Write a note on origin and formation of mountains based on geosyncline theory. 2+8=10

Or

Explain briefly the continental drift hypothesis and seafloor spreading theory with suitable diagrams. 10

5. What is non-diastrorphic structure? Explain how non-diastrorphic structures are useful to determination of top and bottom or direction of younging of layered rocks. 2+8=10

Or

Explain briefly about different types of normal fault. Write a note on genetic classification of fault. 5+5=10

6. Write short notes on any *two* of the following : 5×2=10

- (a) Disjunctive foliation
- (b) Causes and mechanics of folding
- (c) Different types of unconformity

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