

CC/M/EXAM.

2020

GEOLOGY

PAPER—I

Time : 3 hours]

[Full Marks : 250

Note : Question Nos. 1 and 5 are compulsory and out of the remaining, any **three** are to be attempted choosing at least ONE question from each Section. The number of marks carried by a question/part is indicated against it.

SECTION—A

1. Answer *any five* of the following questions :

- (a) Write about the criteria of classification of meteorites. What is the difference between asteroid and meteorite? 8+2=10
- (b) Explain why volcanic eruptions occur. Also explain the terms 'tephra' and 'volcanic ash'. 8+2=10
- (c) Write about the landforms formed by alluvial rivers. 10
- (d) Explain the scope of application of geomorphology in mineral prospecting. 10
- (e) Explain how strain markers help to understand deformations in rocks. 10
- (f) Write on strain ellipsoid and its uses in structural geology. 10
- (g) Explain the pitch and plunge of a linear feature. 5+5=10

2. Answer the following questions :

- (a) Write on the internal structure of the earth and explain how these are determined. 10+10=20
- (b) Explain with suitable sketch, the seismic hazard zones of India. Also write on what basis the zones are demarcated. 10+5=15
- (c) Write elaborately on the theory of plate tectonics. 15

3. Answer the following questions :

- (a) Explain the difference between geostationary and polar orbital satellites and their uses. Write on the different sensors of Indian remote sensing satellites. Briefly explain the mechanism of 3D imaging from satellite sensors. 7+8+5=20
- (b) Explain Davisian model of landform development. 15
- (c) Write on the broad geomorphic divisions of India. 15

4. Answer the following questions :

- (a) What is 'dip isogon'? Discuss the geometric classification of folds on the basis of dip isogons. 5+15=20
- (b) Explain the time-relationship between crystallization and deformation of rocks. 15
- (c) How are unconformities formed? What are the different types of unconformities? Explain the significance of unconformities in geology. 3+8+4=15

SECTION—B

5. Answer *any five* of the following questions :

- (a) Write on the application of microfossils in petroleum exploration. Why are megafossils not so important in petroleum exploration? 8+2=10
- (b) Write briefly on Siwalik mammalian fauna. 10
- (c) Discuss the problems arising in delineating the Permian-Triassic geological boundary. 10
- (d) Explain the evolutionary process of the Himalayas through geological time. 10
- (e) On what basis are lithostratigraphic and chronostratigraphic classifications made? Can the lithostratigraphy and chronostratigraphy share a common boundary? 8+2=10
- (f) Explain the hydrologic cycle of the Earth. 10
- (g) Discuss the techniques of groundwater recharging. 10

6. Answer the following questions :

- (a) Write on the geological records of Hominidae evolution. 20
- (b) Explain the various modes of fossil preservations. 15
- (c) Write elaborately on index fossils and their significance in stratigraphy. 15

7. Answer the following questions :

- (a) Write elaborately on Precambrian stratigraphy of Aravalli Craton and mineral deposits of economic importance. 20
- (b) Write on the distribution of Tertiary rocks in India and their economic importance. 15
- (c) Discuss the tectonic framework of India. 15

8. Answer the following questions :

- (a) Write about the methods adopted in groundwater exploration in hard rock terrain. 20
- (b) With neat diagram, explain Darcy's law and also discuss its range of validity and limitation. 15
- (c) Discuss the geological investigations required for construction of dams. 15
