

2020
GEOLOGY
(Theory)

Full Marks : 70

Pass Marks : 21

Time : Three hours

All the questions are compulsory.

The figures in the right hand margin indicate full marks for the questions.

Answer Question Nos. 1 – 4 by choosing the most appropriate one from the given alternatives A, B, C or D and rewrite.

1. Age of the Earth is _____ . 1
 - (A) 4000 million years
 - (B) 4500 million years
 - (C) 5000 million years
 - (D) 5500 million years

2. Chemical composition of gypsum is _____ . 1
 - (A) CaCO_3
 - (B) SiO_2
 - (C) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
 - (D) $\text{Al}_2\text{O}_3 \cdot \text{SiO}_2 \cdot \text{H}_2\text{O}$

3. Which of the following fossil is an example of gastropod ? 1
- (A) Unio
 - (B) Productus
 - (C) Arca
 - (D) Physa

4. Bauxite is an ore of _____ . 1
- (A) Aluminium
 - (B) Copper
 - (C) Zinc
 - (D) Iron

Answer Question Nos. 5 to 14 in one word or sentence.

5. Name the discontinuity line which lies between the crust and the mantle. 1
6. How are trenches formed ? 1
7. What is crystal ? 1
8. Arrange the following minerals in ascending order of hardness :
quartz, apatite, topaz and fluorite 1
9. Why are index fossils useful in establishing the correct age of rock beds in which they occur ? 1
10. Why is the outer layer of brachiopod shell not preserved as fossils ? 1
11. Distinguish between simple ore and complex ore. 1
12. Differentiate early magmatic concentration from late magmatic concentration by giving one point. 1

13. The quantity of ore mineral solely depends on the presence of gangue mineral. Justify. 1
14. Why does the chromite of Manipur belong to early magmatic concentration? 1

Answer Question Nos. 15 to 24 in about 30 – 40 words.

15. What is weathering? 2
16. Why is chemical weathering more important than mechanical weathering? 2
17. Why is box-fold called coffer fold? 2
18. Define mineral. 2
19. Give the relationship between fracture and cleavage. 2
20. Convert the following weiss symbols into miller indices : 2
- (i) $a, \infty b, \infty c$
- (ii) $a, 2b, \infty c$
21. 'In the reconstruction of palaeogeography of the earth, fossils are paramount significance'. Explain with example. 2
22. Define fossils. Where is the term 'fossil' derived from? 2
23. What is gangue mineral? Name a gangue mineral associated with the ore mineral galena. 2
24. Explain the geographical distribution of coal deposits in India. 2

Answer Question Nos. 25 to 31 in about 40 – 50 words.

25. Explain in brief the nebular hypothesis of the Earth's origin. 3
26. Why is Engineering geology so important now-a-days? 3

27. Draw and label a neat diagram showing combination of second order prism and pyramid of tetragonal system. 3
28. Why is calcite rhomb used in the construction of Nicol prism? 3
29. Identify the conditions favourable for the preservation of organisms as fossils. 3
30. Justify the fact that yossan is the indicator of mineral deposits. 3
31. The high grade bauxite deposits in the high Himalayas and lead deposits of Antaretica regions are not considered as ore minerals at the present. Why? Give reasons. 3

Answer Question Nos. 32 to 34 in about 200 words each.

32. Explain the tectonic causes of an Earthquake. 5
33. Elucidate the symmetry elements of cubic system or hexagonal system. 5
34. Describe the morphological characteristics of the Lamellibranchia shell. 5