

- 01.** Booklungs are found in :
- | | |
|--------------|------------------|
| (1) Amoeba | (2) Polystomella |
| (3) Euglypha | (4) Arachnids |
- 02.** Silk is obtained from :
- | | |
|----------------|-----------------------|
| (1) Adult moth | (2) Caterpillar stage |
| (3) Egg | (4) Cocoon |
- 03.** Neurogenic heart is found in :
- | | |
|------------------|-------------------|
| (1) Human beings | (2) Rat |
| (3) Rabbit | (4) Invertebrates |
- 04.** Epiphysis is also known as :
- | | |
|-------------|------------------|
| (1) Pineal | (2) Pituitary |
| (3) Thyroid | (4) Hypothalamus |
- 05.** Simplest and smallest form of amino acid is :
- | | |
|-------------|--------------|
| (1) Glycine | (2) Proline |
| (3) Lysine | (4) Argenine |
- 06.** PCOS is related to :
- | | |
|------------|-------------|
| (1) Ovary | (2) Uterus |
| (3) Testes | (4) Oviduct |
- 07.** Seminogelin is secreted by :
- | | |
|------------------|---------------------|
| (1) Epididymis | (2) Seminal Vesicle |
| (3) Thecal cells | (4) Oviduct |

08. First cleavage in frog is :

- | | |
|----------------|-----------------|
| (1) Horizontal | (2) Meridional |
| (3) Equatorial | (4) Latitudinal |

09. Which of the following is nuclear receptor ?

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|--------|----------|
| (1) AR | (2) GPCR |
| (3) IR | (4) MT1 |

10. Cryptorchidism is related to :

- | | |
|------------|--------------|
| (1) Testes | (2) Thyroid |
| (3) Ovary | (4) Pancreas |

11. Herringbone cross-beds suggest:

- | | |
|-------------------------------|------------------------|
| (1) River sedimentation | (2) Tidal influence |
| (3) Deep marine sedimentation | (4) Desert environment |

12. Arkoses are:

- (1) Quartz-rich sandstones
- (2) Feldspar-rich sandstones
- (3) Matrix-rich sandstones
- (4) Rock fragments-rich sandstones

13. Illitization is the process in which:

- (1) Chlorite converts into illite
- (2) Feldspar converts into clay
- (3) Chert converts into quartz
- (4) Biotite converts into vermiculite

14. Thermal maturity of coal is determined by measuring reflectance of which of the following maceral :
- | | |
|----------------|------------------|
| (1) Inertinite | (2) Liptinite |
| (3) Vitrinite | (4) All of above |
15. Cannel coals are rich in:
- | | |
|--------------|---------------|
| (1) Alginate | (2) Sporinite |
| (3) Both | (4) None |
16. A good reservoir rock for hydrocarbons should have:
- (1) Porosity
 - (2) Permeability
 - (3) Both porosity and permeability
 - (4) None
17. The post-mortem history of fossils is studied under the branch of:
- | | |
|---------------------|-------------------|
| (1) Ichnology | (2) Palaeoecology |
| (3) Biostratigraphy | (4) Taphonomy |
18. In brachiopods, the pedical valve is also called as :
- | | |
|--------------------|-------------------|
| (1) Brachial valve | (2) Ventral valve |
| (3) Right valve | (4) Dorsal valve |
19. Ediacaran fauna belong to:
- | | |
|---------------------|-----------------------|
| (1) Mesoproterozoic | (2) Palaeoproterozoic |
| (3) Neoproterozoic | (4) Archaeozoic |

20. The Coccoliths are microscopic:

- | | |
|------------------|----------------------|
| (1) Marine algae | (2) Non-marine algae |
| (3) Marine fungi | (4) Non-marine fungi |

21. Which of the following microfossil groups is useful in stratigraphic correlation of a marine with a non-marine sequence ?

- | | |
|------------------|----------------|
| (1) Foraminifera | (2) Radiolaria |
| (3) Pteropoda | (4) Ostracoda |

22. Assign Kajrahat Formation to the correct Group in the following:

- | | |
|------------|-------------|
| (1) Kaimur | (2) Bhandar |
| (3) Semri | (4) Rewa |

23. Which one is correct definition of carbonatite ?

- (1) Carbonatite are igneous rock that contains > 50% by volume of carbonate minerals.
- (2) Carbonatite are igneous rock that contains 10% to 50% by volume of carbonate minerals.
- (3) Carbonatite are igneous rock that contains > 90% by volume of carbonate minerals.
- (4) Carbonatite are igneous rock that contains < 50% by volume of carbonate minerals.

24. Micrographic intergrowth of quartz and alkali feldspar is known as:

- | | |
|------------------------|-------------------------|
| (1) Myrmekite texture | (2) Granophyre texture |
| (3) Variolitic texture | (4) Symplectite texture |

25. Which one of the following system is also known as "Petrogeny's Residual System" ?
- (1) Nepheline-Anorthite-Silica system
 - (2) Nepheline-Diopside-Silica system
 - (3) Nepheline-Anorthite-Kalsilite system
 - (4) Nepheline-Kalsilite-Silica system
26. Precision of a chemical analysis refers to:
- (1) Lowest concentration which can be 'determined' by a particular method/instrument
 - (2) Repeatability of a measurement
 - (3) An estimate of how close our measured values is to the true value
 - (4) All the three above
27. An atom, called nuclide, is described by :
- (1) Specifying the number of protons and the number of neutrons in the nucleus
 - (2) Specifying the number of protons and the number of electrons in the nucleus
 - (3) Specifying the atomic number and mass number
 - (4) Specifying the number of protons only

28. What is an isochron diagram ?

- (1) An isochron diagram is a bivariate plot of measured daughter-parent isotope ratios for a suite of cogenetic samples.
- (2) An isochron diagram is a bivariate plot of measured parent-daughter isotope ratios for samples of different origin.
- (3) An isochron diagram is a trivariate plot of measured parent-daughter isotope ratios for a suite of cogenetic samples.
- (4) An isochron diagram is a bivariate plot of measured parent-daughter isotope ratios for a suite of cogenetic samples.

29. The maximum amount of dip of a bed is measured along $N40^{\circ}E$. The strike direction of the bed is :

- | | |
|--------------------|--------------------|
| (1) N-S | (2) E-W |
| (3) $N50^{\circ}W$ | (4) $S50^{\circ}W$ |

30. The amount of dip measured along the strike direction of a vertical bed is :

- | | |
|------------------|------------------|
| (1) 45° | (2) 60° |
| (3) 90° | (4) Zero |

31. The angle of inclination of hinge line with the horizontal is :

- | | |
|-----------|------------|
| (1) Dip | (2) Plunge |
| (3) Pitch | (4) Strike |

32. Which of the following structures is best indicator of flow direction ?
- (1) Ripple mark (2) Mud crack
(3) Graded bedding (4) Rain prints
33. Foliation in a rock is defined as :
- (1) A planar feature with randomly oriented minerals
(2) A planar feature with well oriented minerals
(3) A linear feature with randomly oriented minerals
(4) A linear feature with well oriented mineral
34. When a bedded sedimentary rock overlying the non-bedded igneous rock, then it is known as :
- (1) Disconformity (2) Nonconformity
(3) Angular unconformity (4) Blended unconformity
35. In a limited are when younger rock is surrounded by older rock, then the structure is called as :
- (1) Klippe (2) Window
(3) Inlier (4) Outlier
36. The facies of Low Pressure metamorphism occupying the maximum width of contact aureole :
- (1) Albite-epidote hornfels facies (2) Hornblende hornfels facies
(3) Pyroxene hornfels facies (4) Sanidinite facies

37. In the thin section of a regional metamorphic rock, the garnet core has 'S'-shaped inclusion trail while the garnet rim is inclusion free with idioblastic outline then what should be the most appropriate conclusion :
- (1) Deformation outlasted crystallization
 - (2) Crystallization outlasted deformation
 - (3) No relationship can be suggested between deformation and crystallization
 - (4) It depends on where more inclusions were present in the matrix
38. Paired metamorphic belts are characterized by two juxtaposed linear belts of :
- (1) low-T, high-P metamorphic mineral assemblage and another characterized by high-T, low-P mineral assemblage without a fault in between
 - (2) low-T, high-P metamorphic mineral assemblage and another characterized by high-T low-P mineral assemblage separated by a fault between the two
 - (3) low-T, high-P metamorphic mineral assemblage and another characterized by intermediate P, high T separated by a fault between the two
 - (4) Intermediate-T, high-P metamorphic mineral assemblage and another characterized by high-T, low-P mineral assemblage without a fault in between

39. The fluid during the granulite facies metamorphism leading to charnockites of South India is :
- (1) H_2O (2) CO_2
(3) Mostly H_2O with little CO_2 (4) Mostly CO_2 with little H_2O
40. Why Thompson's AFM projection is not useful for the metamorphic rocks deficient in muscovite and rich in K feldspar?
- (1) Because biotite cannot be plotted
(2) AFM projection is useful only for pelitic rocks
(3) Because the reaction muscovite+quartz = K-feldspar + sillimanite + H_2O has taken place
(4) Simple because the biotite plots within the triangle

Short Answer Questions

Note: Attempt any **five** questions. Write answer in **150-200** words. Each question carries **16** marks. Answer each question on separate page, after writing Question Number.

- 01.** Discuss the significance of asymmetric shear sense indicators. Do the σ and δ type shear sense indicators have any significance for the rate of deformation/rate of crystallization relationship.
- 02.** What are the three types of plate margins? Discuss the significance of each one of them.
- 03.** Write a note on the relation between magma generation and tectonic setting.
- 04.** Write a note on the use of Nd-isotopes in igneous rock petrogenesis.
- 05.** Discuss the Paleontological criteria for demarcating Precambrian/Cambrian boundary.
- 06.** Application of foraminifera in paleotemperature estimation.
- 07.** Discuss the Greywacke problem.
- 08.** Write a note on structural traps.
- 09.** What is geothermobarometry? Formulate an equation for either a geothermometer or a geobarometer.
- 10.** What are P-T-t paths? Discuss their significance.