

Earth, Atmospheric, Ocean and Planetary Sciences Paper II

Time Allowed : 75 Minutes]

[Maximum Marks : 100

Note : This Paper contains **Fifty (50)** multiple choice questions. Each question carries **Two (2)** marks. Attempt *All* questions.

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| <p>1. Which of the following layered igneous complex is <i>not</i> employed in Deccan Volcanic Province ?</p> <p>(A) Sittampundi</p> <p>(B) Girnar</p> <p>(C) Phenaimata</p> <p>(D) Mundwara</p> <p>2. REE's are usually normalised to chondrite reference standard because :</p> <p>(A) Chondrites are ultrabasic rocks</p> <p>(B) Chondrites are very rarely found</p> <p>(C) Chondrites are the unfractionated samples of the solar system dating from original nucleosynthesis</p> <p>(D) Chondrites are most commonly present sediments</p> | <p>3. Krol and Tal formations of lesser Himalaya represents the following time horizon :</p> <p>(A) Cambro-Ordovician</p> <p>(B) Precambrian-Cambrian</p> <p>(C) Permo-Triassic</p> <p>(D) Jurassic-Cretaceous</p> <p>4. The capacity of a saturated rock to drain water under the force of gravity is called</p> <p>(A) Adhesion</p> <p>(B) Specific yield</p> <p>(C) Specific retention</p> <p>(D) Surface tension</p> |
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[P.T.O.]

5. One of the following statements about mass wasting is *incorrect* :

- (A) When no water is present friction among closely packed particles on slopes holds them in place
- (B) When no water is present friction among loosely packed particles on slopes holds them in place
- (C) When the soil is saturated the grains are forced apart and friction is increased allowing the soil to move up slope
- (D) When the soil is saturated the grains are forced apart and friction is reduced allowing the soil to move downslope

6. Gravimetry, Nephelometry, Lidar method etc. are some of the methods used for monitoring

- (A) Hydrocarbons and ozone
- (B) Suspended particulate matter
- (C) Trace metals
- (D) NO-NO_x

7. Major metallogenic provinces are located in :

- (A) Continental collision zones
- (B) Mid ocean ridges
- (C) Active continental margin settings
- (D) Continental rift settings

8. For the stress-strain relation, the Hooke's law holds true only in the following condition :
- (A) Plastic Deformation
 - (B) Anelastic limit
 - (C) Linear range of elasticity
 - (D) Permanent strain
9. In Brunton Compass which of the following markings are transposed ?
- (A) E and W
 - (B) N and S
 - (C) E, W, N and S
 - (D) W and S
10. The muscles close the valves and form the central muscle-scar pattern on the valves of ostracods.
- (A) Central
 - (B) Abductor
 - (C) Adductor
 - (D) Zenker's
11. In ACF diagrams, the suffix 'A' stands for :
- (A) FeO
 - (B) FeO + Fe₂O₃ + MnO
 - (C) FeO + MgO + MnO
 - (D) FeO + Fe₂O₃
12. Deformation of an early schistosity by a later one gives rise to :
- (A) Phyllonite
 - (B) Lepidoblastic texture
 - (C) Porphyroblasts
 - (D) Crenulation cleavage
13. When water is pumped from wells in some coastal areas, a problem arises known as :
- (A) Saltwater incursion
 - (B) Permeability decrease
 - (C) Artesian recharge
 - (D) Permeability increase

14. An igneous texture where all cumulus grains are in contact with one another along boundaries is called

- (A) Adcumulate
- (B) Mesocumulate
- (C) Orthocumulate
- (D) Crescumulate

15. Dendritic, bifurcating erosional features called as ril marks are produced by erosion when water drain out of soft sediment surface at the falling water level. These are signatures of

- (A) dry surface
- (B) thick water column
- (C) violently flowing water
- (D) thin water cover

16. When the older beds within a sequence of sediments are tilted or deformed, before being buried by the younger beds, the resultant feature is called an

- (A) angular unconformity
- (B) unconformity
- (C) disconformity
- (D) non-conformity

17. Arkosic and lithic are the terms used for sandstones having :

- (A) < 25% feldspar
- (B) > 25% feldspar and lithic content
- (C) > 60% of fossil fragments
- (D) < 30% of debris

18. Oldoinyo lengai volcano in northern Tanzania is known for :
- (A) Basaltic eruption
 - (B) Carbonatite eruption
 - (C) Rhyolite eruption
 - (D) Andesite eruption
19. The current standard model of the Earth's internal structure called PREM is derived from :
- (A) Inversion seismology
 - (B) Forward seismology
 - (C) Borehole prediction
 - (D) P-T paths
20. The lunar torque over spinning earth affects the axis of the earth to cause :
- (A) Tilting
 - (B) Precession
 - (C) Vibration
 - (D) Angular momentum
21. Evolutionary change within population and species is termed as :
- (A) Macro evolution
 - (B) Micro evolution
 - (C) Syngenetic evolution
 - (D) Biotic evolution

22. The hominids (family Hominidae) the primate family that includes present day humans and their extinct ancestors, have a fossil record extending back.
- (A) 1.6 million years
 - (B) 2.0 million years
 - (C) 4.4 million years
 - (D) 1.9 million years
23. The standard deviation is :
- (A) a measure of central tendency
 - (B) the square of variance
 - (C) a measure of variability
 - (D) a measure of skewness
24. Which one of the following statements is *correct* ?
- (A) Dinosaurs became extinct during the Pleistocene Ice Age
 - (B) Dinosaurs evolved during the late permian but were most diverse during carboniferous
 - (C) Pterosaurs were non-flying vertebrate animals
 - (D) Triassic mammals and reptiles were not very diverse and all were small sized
25. Seawater in equilibrium with atmospheric CO₂ is slightly :
- (A) Acidic
 - (B) Alkaline
 - (C) Neutral
 - (D) Turbid

26. Phanerozoic continental growth occurs in :
- (A) Rift setting
 - (B) Arc setting along active plate margins
 - (C) Continental collisional settings
 - (D) Intraplate settings
27. The Nanga Parbat syntaxis is a northwardly plunging in the core of which occur proterozoic gneisses.
- (A) Synclinal structure
 - (B) Antiformal structure
 - (C) Transcurrent fault
 - (D) Monoclinical structure
28. The oldest dated rock in the Dharwar craton is :
- (A) Closepet granite
 - (B) Kolar granite
 - (C) Gorur gneiss
 - (D) Champion gneiss
29. The following represents the correct stratigraphic order in the Siwalik Group :
- (A) Nagri-Dhok Pathan-Tatrot
 - (B) Chinji-Kamlial-Nagri
 - (C) Nagri-Chinji-Pinjor
 - (D) Tatrot-Chinji-Nagri
30. One of the following is *not* associated with steeper alluvial fans in arid regions :
- (A) Increased grain size
 - (B) Poor sorting
 - (C) Increased discharge
 - (D) Increased concentration of the sediment load

31. The great increase in atmospheric dust during glaciations is not due to :
- (A) Increase in wind intensity
 - (B) Increased exposure of extensive sediment source areas on meltwater flood plains
 - (C) Increased chemical weathering
 - (D) Increase in the exposed area of the continental shelves by lowered sea level
32. Paired river terraces are significant evidence of :
- (A) Vertical downcutting in an intermittent fashion
 - (B) Lateral erosion in an intermittent fashion
 - (C) Vertical downcutting in a continuous fashion
 - (D) Lateral erosion in a continuous fashion
33. Fluid containing dissolved chemicals escaping from waste disposal sites is :
- (A) Slurry
 - (B) Effluent
 - (C) Influent
 - (D) Leachates
34. The washing out of the fine soil components from upper to lower soil horizons is known as :
- (A) Leaching
 - (B) Solum
 - (C) Illuviation
 - (D) Eluviation

35. The distance between the highest level of water in the reservoir and the top of the dam is called as :
- (A) Free board
(B) Suspension board
(C) Heel of the dam
(D) Toe of the dam
36. Abrupt and extremely fast movement of loosened blocks and pieces of jointed or fractured rocks from cliffs and steep slopes is called
- (A) Debris flow
(B) Rock fall
(C) Rock slide
(D) Earth fall
37. Climatologically, the frequency of the thunderstorms is the highest in :
- (A) Tropical Regions
(B) Areas poleward of 45° latitude
(C) Polar regions
(D) Areas poleward of 60° latitude
38. The atmosphere is in the state of absolute instability when :
- (A) Environmental Lapse Rate (ELR) is higher than Dry Adiabatic Lapse Rate (DALR)
(B) ELR is lower than Saturated Adiabatic Lapse Rate (SALR)
(C) ELR is higher than SALR
(D) ELR is zero

39. During active monsoon conditions, the position of the monsoon trough is :
- (A) At the normal position
 - (B) To the north of its normal position
 - (C) To the south of its normal position
 - (D) At equator
40. Specific yield is maximum in :
- (A) Clay
 - (B) Silt
 - (C) Gravel
 - (D) Sand
41. In unconfined aquifers, the upper surface of water is called :
- (A) Phreatic level
 - (B) Water table
 - (C) Vadose level
 - (D) Peizometric surface
42. What is high-field strength elements (HFSE) in geochemistry ?
- (A) Elements that form ions with higher charge than +2
 - (B) Elements that form ions with lower charge than +2
 - (C) Elements that have ions with charge equal to +2
 - (D) Elements that have ions with charge equal to +1

43. Which of the following isotopic dating method is suitable for archaean ultramafic rocks :
- (A) U-Pb method
- (B) K-Ar method
- (C) Rb-Sr method
- (D) Sm-Nd method
44. World largest Barites deposit is located in :
- (A) Managampet in Cuddapah basin
- (B) Superior province in Canada
- (C) Vindhyan basin in central India
- (D) Witwatersand in South Africa
45. Fluorite deposit in India occurs at :
- (A) Amba Dorger
- (B) Amba Ji
- (C) Kala Dorger
- (D) Girnar Complex
46. Magnetite (Fe_3O_4) is the end-member of the solid-solution series of :
- (A) Pseudobrookite-Magnetite
- (B) Ilmenite-Ulvospinel
- (C) Ulvospinel-Magnetite
- (D) Magnetite-Ilmenite

47. The apparent resistivity equation

$$\rho_a = 2\pi a (V/I) \text{ is true for :}$$

- (A) Wenner arrangement
- (B) Schlumberger arrangement
- (C) Dipole arrangement
- (D) Self-potential arrangement

48. The line bisecting the acute angle between the two optic axes is called :

- (A) Isogyre
- (B) Melatope
- (C) Acute bisetrix
- (D) Obtuse bisetrix

49. Quartz is an exmple of

- (A) Cyclosilicate
- (B) Inosilicate
- (C) Tectosilicate
- (D) Phyllosilicate

50. One of the following is *not* a geostationary satellite.

- (A) RESOURCESAT-2
- (B) KALPANA-1
- (C) GSAT-2
- (D) INSAT-4A

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ROUGH WORK