

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. is a plutonic igneous body that has an areal extent greater than 100 km^2 and was originally thought to extend to considerable depth.</p> <p>(A) Plug</p> <p>(B) Batholith</p> <p>(C) Lopolith</p> <p>(D) Laccolith</p> <p>2. Which of the following is <i>not</i> true of REEs ?</p> <p>(A) Most of the REEs form stable 3^+ ions of same size</p> <p>(B) REEs with even atomic numbers are less stable than those with odd atomic numbers</p> <p>(C) REEs with even atomic nos. are more abundant than those with odd atomic numbers</p> <p>(D) Ce and Eu exist in "other than" 3^+ oxidation state</p> | <p>3. The Singhbhum mobile belt is delimited by the copper belt thrust zone in the south and the on the north.</p> <p>(A) Chotanagpur granite-gneiss</p> <p>(B) Sukinda thrust</p> <p>(C) Great boundary fault</p> <p>(D) Singhbhum granite</p> <p>4. An overdraft of groundwater causes of ground surface over the depleted aquifer constituted of unconsolidated or poorly consolidated sediments.</p> <p>(A) Sinking</p> <p>(B) Rupture</p> <p>(C) Depression</p> <p>(D) Subsidence or sagging</p> |
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5. Slow downslope movement of the slope forming material is known as :
- (A) Creep
 - (B) Flow
 - (C) Topple
 - (D) Slide
6. One of the following properties is *not* applicable to braided rivers :
- (A) Bedload to total load is high
 - (B) Suspended load to total load is high
 - (C) The bedload is dominated by silt and clay
 - (D) The bedload to suspended load ratio is less than 1
7. Banded Iron Formations (BIFs) in the Archaean greenstone belts are best witness for :
- (A) Archaean sedimentary basin development
 - (B) Shift from anoxic to oxygenated environments
 - (C) Archaean tectonics
 - (D) Archaean weathering processes
8. The true distribution of mass inside the earth is expressed by :
- (A) Gravity Anomaly
 - (B) Density
 - (C) Topography
 - (D) Geoid

9. Functions of a compass, clinometer and hand level are combined in which of the following instruments ?
- (A) Clinometer
 - (B) Altimeter
 - (C) Hand held GPS
 - (D) Brunton Compass
10. A thrust is a :
- (A) Low-angle reverse fault
 - (B) Normal fault
 - (C) Wrench fault
 - (D) Transform fault
11. Mangrove forests fall in one of the following coastal regulation zones (CRZs) :
- (A) CRZ-I
 - (B) CRZ-II
 - (C) CRZ-III
 - (D) CRZ-IV
12. A dam composed of a single concrete wall curved in plan with its convex face upstream, and where the parts of the water load is transmitted to the adjacent rock abutments is called :
- (A) Buttress dam
 - (B) Gravity dam
 - (C) Arch dam
 - (D) Penstocks
13. Chambers are arranged in a fashion as in the genus spiroloculina.
- (A) Triloculine
 - (B) Spiroloculine
 - (C) Biserial
 - (D) Triserial

14. 'Snow ball garnet' is a good indicator.
- (A) Pre-tectonic
 (B) Post-tectonic
 (C) Syntectonic
 (D) Inter-tectonic
15. Indicate the *correct* heavy mineral assemblages of the major source rocks :
- (A) Fluorite, garnet, muscovite, monazite, topaz, kyanite — Granite pegmatite
 (B) Rounded grain common, barite, rutile, hematite, olivine — Basalt
 (C) Augite, diopside, hypersthene, chromite, olivine, quartz — Basic Igneous rock
 (D) Andalusite, garnet, staurolite, zoisite, epidote, kyanite, sillimanite — Metamorphic rock
16. Glaucophane-Lawsonite association is the characteristic of :
- (A) Blueschist facies
 (B) Amphibolite facies
 (C) Hornfels facies
 (D) Eclogite facies
17. SiO₂ and Al₂O₃ in shale constitute nearly respectively.
- (A) 58.10% and 15.40%
 (B) 45.2% and 10.3%
 (C) 10.3% and 26.4%
 (D) 14.6% and 10.3%
18. The ratio of quartz to the relatively unstable components, feldspar and rock fragments is used as an indicator of :
- (A) Petrographic criteria
 (B) Mineralogical maturity of sandstone
 (C) Source of the minerals
 (D) Diagenetic process of sandstone

19. Metaluminous granites in which the mole proportions of $\text{Al}_2\text{O}_3/(\text{K}_2\text{O} + \text{Na}_2\text{O} + \text{CaO}) < 1$ appear to have formed from the melting of mafic igneous rocks and may even involve a mantle derived component are designated as :
- (A) S-type granites
 - (B) A-type granites
 - (C) M-type granites
 - (D) I-type granites
20. In the seismic body waves, the surface in which all particles vibrate with the same phase is called :
- (A) Wave front
 - (B) Wave length
 - (C) Attenuation surface
 - (D) Rayleigh surface
21. Moving objects on the rotating Earth experience additional accelerations related to the velocity at which they are moving is explained by :
- (A) Geoid acceleration
 - (B) Nutation
 - (C) Angular drift
 - (D) Coriolis effect
22. The region of overlap between the epivalve and hypovalve of a frustule is called :
- (A) Polar nodule
 - (B) Epivalve
 - (C) Raphe
 - (D) Girdle

23. The earliest member of our own genus Homo is Homo habilis, which lived million years ago.
- (A) 2.0 to 3.0
 - (B) 1.6 to 1.8
 - (C) 0.8 to 1.0
 - (D) 2.5 to 1.6
24. Arrange the following flood basalt provinces in the right chronological order (oldest to youngest) :
- (a) Deccan Basalt Province
 - (b) Siberian Traps
 - (c) Parana Province
 - (d) Columbia River Basalt
- (A) *a b c d*
 - (B) *b c a d*
 - (C) *d a b c*
 - (D) *d c b a*
25. Aseismic or passive margins are also called as continental margins.
- (A) Atlantic type
 - (B) Pacific type
 - (C) Mariana type
 - (D) Chilean type
26. A zone in the Earth extending from depths of approximately 70 to 250 km in which shear-wave velocities markedly decrease; this zone is known as the :
- (A) D"
 - (B) Mohorovicic discontinuity
 - (C) Low-velocity layer
 - (D) Brittle-ductile transition

27. The following is the *correct* stratigraphic order for the Paleozoic Tethyan sequence in the Spiti basin :
- (A) Haimanta—Vaikrita—Lilang
(B) Vaikrita—Haimanta—Lilang
(C) Lilang—Kuling—Haimanta
(D) Haimanta—Lilang—Kuling
28. The Jurassic-Cretaceous boundary in the Kachchh basin is represented by :
- (A) Katrol-Umia F.
(B) Pachcham-Chari F.
(C) Chari-Katrol F.
(D) Katrol-Chari F.
29. The modified mercalli scale used in expressing intensity of Earthquake varies between :
- (A) -1 and +1
(B) 0 and 10
(C) 1 and 12
(D) -10 and +10
30. Stream that does *not* exhibit any control of the underlying bed rock structures is known as :
- (A) Subsequent stream
(B) Consequent stream
(C) Insequent stream
(D) Obsequent stream

31. One of the following drainage patterns is generally associated with folded sedimentary rocks :
- (A) Dendritic
 - (B) Trellis
 - (C) Rectangular
 - (D) Barbed
32. BOD represents the activity of dissolved oxygen :
- (A) Required during oxidation of decomposable organic matter
 - (B) Released during reduction of non-decomposable organic matter
 - (C) Released during chemical reaction
 - (D) Absorbed during decomposition of non-organic matter
33. Soils containing large amount of clay which shrink upon drying and swell with addition of water belongs to one of the following world soil orders :
- (A) Oxisols
 - (B) Spodosols
 - (C) Ultisols
 - (D) Vertisols
34. One of the following is *not* a mechanical weathering process :
- (A) Frost wedging
 - (B) Hydration
 - (C) Salt Crystal Growth
 - (D) Unloading

35. Rock bursts during tunnel

excavations is an evidence of :

- (A) Pressure relief
- (B) Temperature relief
- (C) Microseismicity
- (D) Faulting

36. The region of India which receives

enhanced rainfall during break
monsoon is :

- (A) Uttar Pradesh
- (B) Tamil Nadu
- (C) Rajasthan
- (D) Orissa

37. During winter, the northern regions
of India receive precipitation due
to :

- (A) Tropical Cyclones
- (B) Western Disturbances
- (C) Mid Tropospheric Cyclones
- (D) Easterly Waves

38. As per Koppen's climatic
classification, the tropical regions
are designated as :

- (A) Region C
- (B) Region A
- (C) Region F
- (D) Region E

39. A piezometric surface is found in :

- (A) Unconfined aquifer
- (B) Confined aquifer
- (C) Perched aquifer
- (D) Leaky aquifer

40. Excessive rain within a short period is called :

- (A) Thunder burst
- (B) Cloud burst
- (C) Cloud fall
- (D) Flash flood

41. The mass difference between any two pairs of radiogenic isotopes is :

- (A) too big
- (B) too small
- (C) no mass difference
- (D) mass changes

42. Which of the following group of elements is known as alkaline earth ?

- (A) Be, Mg, Ca, Sr, Ba and Ra
- (B) Na, K, Al, Rb, Si and Th
- (C) Mn, Fe, Cu, B, Br and I
- (D) Co, Zr, Y, La, Ce and Nd

43. Sukinda Complex is famous for :

- (A) Cu-Zn deposits
- (B) Diamond
- (C) Chromite
- (D) Gold

44. The only working gold mine in India is :

- (A) Kolar Gold Field
- (B) Hutti Gold Mine
- (C) Ajjanahalli Gold Mine
- (D) G.R. Halli Gold Mine

45. Pratt and Airy's models of isostasy had serious deficiencies for regional compensation as the equalization is made by :

- (A) Vertical columns under topographic load
- (B) Vertical columns of density
- (C) Mantle substratum
- (D) Crustal Roots

46. Material in which magnetization develops in the opposite direction to the applied field is called :

- (A) Diamagnetic
- (B) Paramagnetic
- (C) Ferromagnetic
- (D) Antiferromagnetic

47. Identify the uniaxial (+ve) mineral from those listed below :

- (A) Quartz
- (B) Calcite
- (C) Chlorite
- (D) Olivine

48. The magnesium rich variety of olivine is called :

- (A) Larnite
- (B) Tephroite
- (C) Fayalite
- (D) Forsterite

49. Which of the following is *not* a type of resolution that is important in image analysis ?

- (A) Spatial
- (B) Spectral
- (C) Temporal
- (D) Parallax

50. Which of the following is the best measure of central tendency ?

- (A) Mean
- (B) Mode
- (C) Standard Deviation
- (D) Range

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