

P. G. GEOLOGY

1. The hypabyssal igneous rock comprising predominantly of plagioclase and orthopyroxene can be classified as
(A) Gabbro (B) Granite (C) Dolerite (D) Rhyolite
2. The freezing point of sea water
(A) increases with salinity (B) is independent of salinity
(C) decreases with salinity (D) increases with evaporation
3. In case of earthquakes isoseismal maps are prepared for their
(A) intensity (B) magnitude
(C) energy (D) frequency
4. Siderophile elements have affinity towards
(A) O (B) Fe (C) Si (D) S
5. The isotope ^{14}C is produced in Earth's atmosphere by the interaction of cosmic rays with
(A) ^{16}O (B) ^{10}B (C) ^{14}N (D) ^{13}C
6. What is the plutonic equivalent of Phonolite ?
(A) Nepheline Syenite (B) Theralite
(C) Ijolite (D) Monzonite
7. Amongst the following options, the acceptable Poisson's ratio of a rock is
(A) 0.55 (B) 1.0 (C) 0.25 (D) -1.0
8. Structure contours of a bedding plane at 100 m interval are spaced in such a manner that the horizontal equivalent is also 100 m. The dip of the bedding plane is
(A) 30° (B) 45° (C) 60° (D) 90°

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9. What will be the Miller-index of the crystal face whose Weiss symbol is given as $a, 2b, \infty c$?
- (A) $a, 2b, \infty c$ (B) $1, 1/2, 0$
(C) $2, 1, 0$ (D) None of the above
10. Quartz is
- (A) uniaxial -ve (B) biaxial +ve
(C) uniaxial +ve (D) biaxial -ve
11. Predict the provenance from the given heavy mineral assemblages.
"Andalusite, garnet, staurolite, zoisite, epidote, kyanite"
- (A) Basic igneous rock (B) Acid igneous rock
(C) Metamorphic rock (D) Reworked sedimentary rock
12. What is the value of Froude Number for supercritical flow of water ?
- (A) $F = 0$ (B) $F = 1$ (C) $F < 1$ (D) $F > 1$
13. According to depositional texture the carbonate rocks having mud-supported framework with $> 10\%$ grain can be classified as
- (A) Mudstone (B) Wackestone
(C) Packstone (D) Grainstone
14. The matrix formed by diagenetic alteration of sand-size grains are called as
- (A) epimatrix (B) protomatrix
(C) orthomatrix (D) pseudomatrix
15. Which coal maceral shows highest reflectance ?
- (A) Vitrinite (B) Liptinite
(C) Inertinite (D) Exinite

16. The greatest principal stress axis is vertical in
- (A) normal fault
 - (B) reverse fault
 - (C) thrust fault
 - (D) strike slip fault
17. Which among the following is a characteristic feature of Echinoids ?
- (A) Telson
 - (B) Aristotle's Lantern
 - (C) Pallial sinus
 - (D) Pedicle
18. The body of strata in which the maximum abundance of a particular species is found is known as
- (A) assemblage zone
 - (B) range zone
 - (C) concurrent zone
 - (D) acme zone
19. Which among the following is not a progressive trend in human evolution history?
- (A) assumption of erect posture
 - (B) shortening of arms
 - (C) increase in jaw power
 - (D) increase in skull capacity
20. The Vempalle shales and limestone formation belongs to
- (A) Papaghani Group
 - (B) Cheyair Group
 - (C) Kistna Group
 - (D) Nallamali Group
21. The magnetic polarity of present rocks with respect to present pole orientation can be grouped under
- (A) Bruhnes normal
 - (B) Jaramilld reversed
 - (C) Gauss normal
 - (D) Gilbert reversed
22. Which is not a component of Steinmann's trinity ?
- (A) Ophiolite
 - (B) Greywackes
 - (C) Arkose
 - (D) Radiolarian cherts

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23. The Sukinda chromite deposits are formed mainly by
- (A) magmatic segregation (B) residual deposit
(C) contact metasomatism (D) supergene enrichment
24. In a sample $\text{Rb}^{87}/\text{Sr}^{87}$ is found in the ratio of 1 : 3. If the half-life of Rb^{87} is 50 by (billion years), the age of the sample is
- (A) 50 by (B) 100 by (C) 150 by (D) 200 by
25. Which type of chemical reaction is represented by following equation ?
- $$\text{CaSO}_4 + 2\text{H}_2\text{O} = \text{CaSO}_4 \cdot 2\text{H}_2\text{O}$$
- (A) Hydrolysis (B) Hydration
(C) Oxidation (D) Reduction
26. Paradoxides is the index fossil of
- (A) Permian period (B) Cambrian period
(C) Triassic period (D) Jurassic period
27. Which metamorphic facies is represented by following mineral assemblages ?
- Omphacite + Garnet + Olivine
- (A) Granulite facies (B) Eclogite facies
(C) Amphibolite facies (D) Greenschist facies
28. Which of the following is a measure of the symmetry of the distribution of grains ?
- (A) Kurtosis (B) Sphericity
(C) Skewness (D) Roundness
29. What would be the critical angle of a mineral, if its refractive index is 2 ?
- (A) 0° (B) 30° (C) 45° (D) 60°

- 30. Which of the following deltas indicates a high ratio of sediment supply to wave energy ?**
- (A) Bird-foot delta (B) Lobate delta
(C) Cuspate delta (D) Arcuate delta
- 31. Which is not a characteristic property of Indian tertiary coal ?**
- (A) Low moisture (B) High calorific value
(C) Low ash content (D) Low sulphur
- 32. Which among the following microfossils are calcareous ?**
- (A) Cocolithophores (B) Radiolarians
(C) Diatoms (D) Conodonts
- 33. First land plant appeared in**
- (A) Cambrian (B) Ordovician
(C) Silurian (D) Devonian
- 34. The space lattice structure of minerals is determined using**
- (A) Chemical analysis (B) Spectroscopic method
(C) X-ray diffraction (D) Scanning electron microscope
- 35. How does the plagioclase composition change from granite to diorite in the granite-diorite series ?**
- (A) Increase towards diorite
(B) Decreases towards diorite
(C) Remains unchanged
(D) Increases up to certain phase then decreases

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36. The index of compositional maturity is determined by

- (A) Quartz / (Feldspar + Rock fragment)
- (B) Feldspar / (Quartz + Rock fragment)
- (C) (Feldspar + Rock fragment) / Quartz
- (D) (Quartz + Rock fragment) / Feldspar

37. Which type of triple junctions are stable for all orientations of plate boundaries ?

- (A) R R R
- (B) R T F
- (C) T T T
- (D) F F R

38. Mid oceanic ridges mark _____ plate margins and can be traced by belts of _____ focus earthquake.

- (A) Constructive, shallow
- (B) Destructive, shallow
- (C) Constructive, deep
- (D) Destructive, deep

39. Choose the copper ores among the following :

1. Chalcopyrite
2. Pyrite
3. Bornite
4. Chalcocite
5. Covellite

- (A) 1, 2, 3, 4
- (B) 2, 3, 4, 5
- (C) 1, 3, 4, 5
- (D) 1, 2, 4, 5

40. Which is the purest form of iron ?

- (A) Cast iron
- (B) Wrought iron
- (C) Native iron
- (D) Pig iron

41. The volcanic topography comprising of alternative layers of pyroclastic materials and Lava is called as

- (A) Strato-volcano
- (B) Shield-volcano
- (C) Cinder cone
- (D) Lava cone

42. Natural Levee is a

- (A) Channel fill deposit
- (B) Floodplain deposit
- (C) Point bar deposit
- (D) None of the above

43. Flowing well results when

- (A) Piezometric surface lies above the ground surface
- (B) Piezometric surface lies at equal height of ground surface
- (C) Piezometric surface lies below the ground surface
- (D) Both A and B

44. What is the definition of ground water ?

- (A) Water found in the zone of saturation
- (B) Water found in the zone of aeration
- (C) Water found below the ground surface
- (D) All of the above

45. Which is considered as the mother of all extinctions ?

- (A) Cretaceous-Palaeocene
- (B) Permian-Triassic
- (C) Carboniferous
- (D) Silurian

46. Folded sedimentary layers can be seen in

- (A) Graded bedding
- (B) Convolute bedding
- (C) Cross bedding
- (D) None of these

47. Chose the odd one

- (A) Grano-blastic
- (B) Ophitic
- (C) Porphyritic
- (D) Graphic

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48. What is the composition of 22 carat gold ?

- (A) Pure gold
- (B) Gold and copper
- (C) Gold and aluminium
- (D) Gold and silver

49. Which of the ore deposits are found at greater depth ?

- (A) Exothermal
- (B) Mesothermal
- (C) Epithermal
- (D) Hypothermal

50. In Wenner array for resistivity Survey, what is the correct relation between potential electrode separation (V) and current electrode separation (I) ?

- (A) $V = I$
- (B) $I = 3V$
- (C) $V = 3I$
- (D) None of the above

51. What type of drainage pattern can be associated with volcanic domes ?

- (A) Dendritic
- (B) Rectangular
- (C) Radial
- (D) Trellis

52. Which are stratified glacial features ?

- (A) Kames
- (B) Cirque
- (C) Moraines
- (D) Yardang

53. Which state is the largest producer of Bauxite in India ?

- (A) Gujarat
- (B) Andhra Pradesh
- (C) Odisha
- (D) Jharkhand

54. Which is the fundamental unit of lithostratigraphic classification ?

- (A) Group
- (B) Formation
- (C) Member
- (D) Bed

55. The Uttatur formation belongs to
- (A) Triassic system of India (B) Jurassic system of India
(C) Cretaceous system of India (D) Siwalik system of India
56. In a virgin area where copper is expected, which method is used to start prospecting.
- (A) Geobotanical (B) Geophysical
(C) Geochemical (D) Drilling
57. Which type of clay is used as drilling mud ?
- (A) China clay (B) Fullers clay
(C) Bentonite clay (D) Fire clay
58. Which is orthorhombic epidote ?
- (A) Zoisite (B) Clinozoisite
(C) Orthite (D) Piedmontite
59. Lepidote is
- (A) Cr-bearing mica (B) F-bearing mica
(C) Li-bearing mica (D) Fe-bearing mica
60. The earliest fossils of foraminifera are found in
- (A) Permian rocks (B) Carboniferous rock
(C) Silurian rocks (D) Upper Cambrian rocks
61. The Deccan volcanism started during
- (A) Late Triassic (B) Early Cretaceous
(C) End of Cretaceous (D) Jurassic

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62. The degree of freedom at the peritectic point of a binary system is
(A) 0 (B) 1 (C) 2 (D) 3
63. Which is an upper Gondwana fossil ?
(A) Schizoneura (B) Gangamopteris
(C) Ptilophyllum (D) Vertebraria
64. Which of the following combination is incorrectly matched ?
(A) Mariana Trench - Atlantic Ocean
(B) Bermuda rise - Atlantic Ocean
(C) Ninety east ridge - Indian Ocean
(D) Carlsberg ridge - Indian Ocean
65. Fissility is best shown by
(A) Sandstone (B) Limestone
(C) Shale (D) Siltstone
66. Which sediment shows very poor sorting ?
(A) Aeolian deposit (B) Fluvial deposit
(C) Glacial deposit (D) Beach deposit
67. Rivers which drain in the opposite direction to the original consequent river are
(A) Subsequent (B) Insequent
(C) Obsequent (D) Resequent
68. The axial relationship in orthorhombic unit cell is
(A) $a = b = c, \alpha = \beta = \gamma = 90^\circ$ (B) $a \neq b \neq c, \alpha = \beta = \gamma = 90^\circ$
(C) $a = b \neq c, \alpha = \beta = \gamma = 90^\circ$ (D) $a = b \neq c, \alpha = \beta = 90^\circ, \gamma = 120^\circ$

69. The intertrappean beds are of
(A) Volcanic origin (B) Marine origin
(C) Fluvio-Lacustrine origin (D) Continental origin
70. Which ray among the following has the maximum penetration power?
(A) Radio wave (B) Micro wave
(C) X-ray (D) Gamma ray
71. In aerial photography what should be the amount of overlap between two adjacent photos?
(A) 30% (B) 40% (C) 50% (D) 60%
72. The characteristic facies of contact metamorphism is
(A) Hornfels (B) Blueschist
(C) Eclogite (D) Granulite
73. The facial sature of the trilobites running through the genal angle is known as
(A) Hypoparian (B) Opsthoparian
(C) Proparian (D) Gonatoparian
74. Which of the following statement is correct for parallel folds?
(A) Orthogonal thickness at hinge > Orthogonal thickness at limb
(B) Axial plannar thickness at hinge = Axial planner thickness at limb
(C) Dip isogons are parallel
(D) Dip isogons are convergent
75. A geological formation neither containing nor-transmitting water is termed as
(A) Aquiclude (B) Aquitard
(C) Aquifer (D) Aquifuge

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76. How many times the amplitude of ground motion during an Earthquake of magnitude 8 in Richter scale is more than that of a magnitude 6 ?

- (A) 2 (B) 20 (C) 10 (D) 100

77. Choose the odd one

- (A) Pyrolusite (B) Manganite
(C) Psilomelane (D) Magnesite

78. At the water table of an unconfined aquifer,

1. Hydrostatic pressure 2. Atmospheric pressure

- (A) $1 = 2$ (B) $1 < 2$
(C) $1 > 2$ (D) $1 \gg 2$

79. Halocline represents the vertical distribution of

- (A) Temperature (B) Salinity
(C) Density (D) Oxygen

80. El-Nino Southern oscillation is an

- (A) Atmospheric process
(B) Oceanic process
(C) Oceanic-atmospheric coupled process
(D) Oceanic-atmospheric-land coupled process

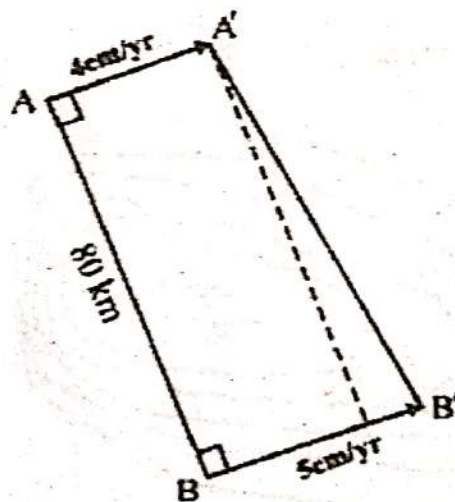
81. Acoustic impedance is the _____ of density and velocity

- (A) Sum (B) Difference
(C) Product (D) Ratio

82. Interference colour depends upon

- (A) Phase difference (B) Thickness of the slice
(C) Birefringence (D) All of the above

83. In a continuous reaction series, there is a continuous change in
- (A) Composition only
 - (B) Crystal structure only
 - (C) Both composition and crystal structure
 - (D) None of the above
84. The dip measured along the strike direction of a vertical bed is
- (A) 0°
 - (B) 45°
 - (C) 60°
 - (D) 90°
85. The half life of a radionuclide A is double that of a radionuclide B . The fraction of A remaining when B is reduced to $1/64$ is
- (A) 0.015
 - (B) 0.031
 - (C) 0.062
 - (D) 0.125
86. Two localities A and B on a continental plate as shown in the figure below are separated by a distance of 80 km. The plate velocities measured at A and B are 4 cm/yr and 5 cm/yr, respectively. Assuming no faulting in the area, the new distance between A and B will be _____ km in one million years.

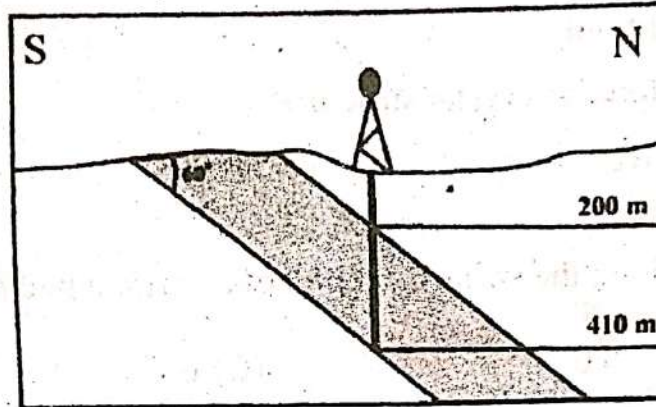


- (A) 80.622
- (C) 1003.194

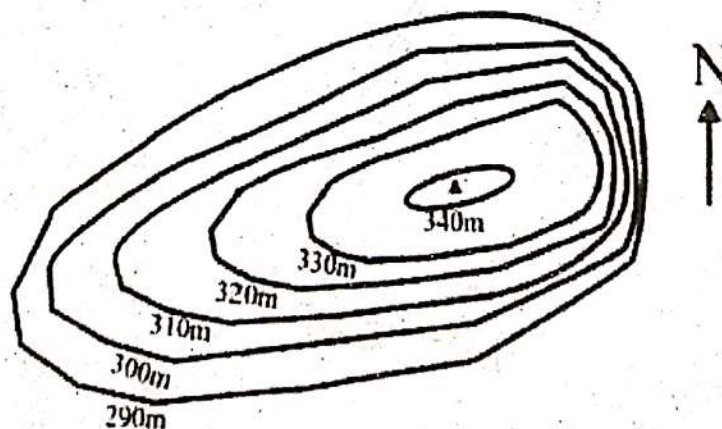
- (B) 128.062
- (D) None of the above

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87. As shown in the following figure, a vertical well intersects the top and bottom of an inclined bed at 200 m and 410 m depths, respectively. If the true dip of the bed is 60° to the north, the true thickness of the bed is _____ metres.



- (A) 210
(B) 105
(C) $105\sqrt{3}$
(D) None of the above
88. The mass number of alpha (α) particle is
(A) 4
(B) 2
(C) 1
(D) 0
89. When plotted on a 1 : 25000 scale, a 2 km long dyke exposed on a horizontal surface has a length of
(A) 4 cm
(B) .4 cm
(C) 8 cm
(D) .8 cm
90. In the topographic map the steepest slope is



- (A) easterly
(B) westerly
(C) northerly
(D) southerly

91. Hooke's law is applicable in case of
(A) twisting (B) stretching
(C) bending (D) all of the above
92. In which type of river/s the reservoir is fed by the groundwater ?
(A) Influent river (B) Effluent river
(C) Both (A) and (B) (D) None of the above
93. The type of unconformity where sedimentary rocks or lava flows overlie the older plutonic rocks is called
(A) Disconformity (B) Non-conformity
(C) Angular unconformity (D) Blended unconformity
94. If the rake of the net slip of a fault is 90° , the fault may be
(A) Strike-slip (B) Dip-slip
(C) Diagonal-slip (D) Tear fault
95. Among the following geological conditions which is most desirable for a proposed dam site ?
(A) Beds with $10^\circ - 30^\circ$ inclinations towards the upstream side
(B) Beds with steep upstream side slope
(C) Beds with steep downstream side slope.
(D) Vertical beds
96. The amount of time needed by a sensor to revisit and acquire data for the exact same location is known as
(A) Radiometric resolution (B) Spatial resolution
(C) Spectral resolution (D) Temporal resolution

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97. Which is/are the active sensor/s among the following ?

(A) RADAR

(B) Push broom scanner

(C) LIDAR

(D) Both (A) and (C)

98. The spectral region of the electromagnetic radiation which passes through the atmosphere without much attenuation is known as

(A) Atmospheric band

(B) Atmospheric window

(C) Atmospheric drift

(D) Atmospheric crab

99. The vertical rock column traversed by network of small ore bearing veins is called as

(A) Stock works

(B) Saddle reefs

(C) Ladder veins

(D) Fissure vein

100. Which colour has the longest wavelength in visible spectrum ?

(A) Blue

(B) Green

(C) Red

(D) None of the above