

*This booklet contains 20 pages including the cover page*

Booklet



Series

**Indian National Earth Science Olympiad**

Maximum marks 100

Date: June 10, 2023 (Sunday) Time: 10.30 a.m. to 12.00 noon

**INSTRUCTIONS**

1. Do not open the Booklet until you are told to do so.
2. **There are 100 objective type questions in this question booklet, and each question carries 1 mark.**
3. You will not be permitted to leave the examination hall until after 30 minutes of commencement of the test.
4. Each question has four answer options marked (A), (B), (C) and (D). Answers are to be marked on the Answer Sheet ( OMR Sheet) which is provided separately.
5. The right to exclude any question(s) from final evaluation rests with the testing authority.
6. Do not seek clarification on any item in the Question Booklet from the test invigilator
7. Please use a BLACK/BLUE ball point pen to mark your answers. DO NOT use pencil.
8. Choose the MOST appropriate answer.
9. Darken the circle corresponding to the answer of your choice. Please do not darken more than one circle against any question, as scanner will read such marking as wrong answer.
10. Answer the questions as given in the Example below.

**Question**

The shape of the Earth is

	A	B	C	D
(a) Spherical	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
(b) Spheroidal				
(c) Ovoid				
(d) Ellipsoidal				

## INTERNATIONAL EARTH SCIENCE OLYMPIAD (IESO)

- Boundaries of subdivisions of the Geological Time Scale are determined on the basis of
  - Radiocarbon Dating
  - Dendrochronology
  - Origin and extinction of fossils
  - $^{210}\text{Pb}$  Dating
- A large part of human-induced carbon dioxide emissions in the atmosphere is utilized by ..... and buried in the sediments.
  - Microorganisms with siliceous skeletons
  - Marine organisms with calcareous skeleton
  - Ice sheets
  - Volcanic eruptions
- Earth has witnessed major mass extinction events
  - Six
  - Five
  - Three
  - One
- Consider the following statements:
  - The Palaeozoic era started about 600 million years ago
  - The Permian period was the longest period in the Palaeozoic era
  - Reptiles evolved during the Carboniferous periodWhich of the statements given above are correct?
  - 1 and 2 only
  - 2 and 3 only
  - 1 and 3 only
  - 1, 2 and 3
- The process of jumping, bouncing and drifting action of sand particles is known as:
  - Hydraulic action
  - Solifluction
  - Saltation
  - Siltation
- Which of the following is not a structural land-form.
  - Syncline
  - Scarp
  - Graben
  - Cuesta
- Which of the following regions receive precipitation from the Western disturbances
  - The Deccan Plateau
  - The Sunderbans
  - The Kashmir Valley
  - None of the above
- Exfoliation is most characteristically found in
  - Granites
  - Spilites
  - Arkoses
  - Orthoquartzites
- Which of the following aeolian features have been commonly observed on the planet Mars
  - Zeugena
  - Yardangs
  - Inselbergs
  - Barchans
- The United Nations Climate Change Conference (COP-27) was held in
  - India
  - United Kingdom
  - Egypt
  - Morocco
- Anthropogenic carbon dioxide absorption by oceans would result in
  - Decrease in  $\text{pCO}_2$
  - Deepening of Lysocline
  - Shallowing of Lysocline
  - Deepening of CCD
- Longwave and shortwave infrared (IR) radiation are present in the troposphere. Which statement among the following is correct?
  - Longwave infrared radiation mostly comes from the Sun
  - Shortwave infrared radiation mostly comes from the Sun
  - The Earth does not emit any infrared radiation (IR)
  - The Sun does not emit any infrared radiation (IR)
- Earth's atmospheric lowest layer is Atmospheric Boundary Layer (ABL), and it contains most of the pollutants along with natural gaseous constituents. Which of the following gas has maximum temporal and spatial variability in the atmospheric boundary level (ABL)?
  - Carbon dioxide ( $\text{CO}_2$ )
  - Ozone ( $\text{O}_3$ )
  - Water vapor ( $\text{H}_2\text{O}$ )
  - Oxygen ( $\text{O}_2$ ) and Nitrogen ( $\text{N}_2$ )

14. The troposphere and the mesosphere both are having turbulence. Tropospheric turbulence is stronger and more intense than the mesospheric turbulence, why?
- Troposphere is having global warming
  - Mesospheric temperature gradient is positive
  - Mesosphere is denser than the troposphere
  - Troposphere is denser than the mesosphere
15. Ground-based measurements of the atmospheric airflow emissions (from the mesospheric and ionospheric heights) using photometers/spectrometers come under which category?
- Active remote sensing
  - In-situ measurements
  - Passive remote sensing
  - None of the above
16. Carbon dioxide (CO<sub>2</sub>), water vapor (H<sub>2</sub>O), and Ozone (O<sub>3</sub>) all three are greenhouse gases and are responsible for the global warming. Which is the most suitable statement about these greenhouse gasses?
- Ozone is a natural greenhouse gas
  - Water vapor is an anthropogenic greenhouse gas
  - Carbon dioxide and Ozone both are anthropogenic greenhouse gas
  - Both, Ozone and Water vapor are anthropogenic greenhouse gas
17. Atmospheric Boundary Layer (ABL) is the lowest layer of the Earth's Atmosphere. Which of the following is having an impact on the ABL dynamics?
- Latent heat flux
  - Sensible heat flux
  - Atmospheric Temperature
  - All of the above
18. Earth's atmosphere is also nomenclatured on the basis of the homogeneous and heterogeneous vertical distribution of the atmospheric constituents. Which among the following is correct?
- The atmosphere below -90 km is known as heterosphere
  - The atmosphere above -90 km is known as heterosphere
  - The atmosphere below -90 km is known as the thermosphere
  - None of above
19. A RADAR (Radio Detection And Ranging) is operating at a frequency of 100 MHz, and receives an echo from the altitude of 450 km. After how much time echo will be received?
- 1.0 milli second
  - 1.5 milli second
  - 3.0 milli second
  - 2.0 milli second
20. The height of the tropopause has latitudinal variations, and it is different in the low, mid, and high-latitude regions. Which is correct among the following?
- Tropopause height is the minimum in the low-latitude regions
  - Tropopause height is the minimum in the mid-latitude regions
  - Tropopause height is the maximum in the low latitude regions
  - Tropopause height is the maximum in the high latitude regions
21. Which radiation in the troposphere is having maximum absorption due to the presence of natural and anthropogenic Greenhouse gases?
- Long waves Infrared Radiations
  - Short waves Infrared Radiations
  - Ultraviolet Radiation
  - Visible Radiations
22. Richardson number is one of the important parameters in the wind investigation. What does it specify?
- Convective heat production and Mechanical turbulence
  - Turbulence and convective heat production
  - Pressure and temperature gradients
  - Mechanical turbulence
23. The ozone (O<sub>3</sub>) is found in the Earth's Stratosphere, Troposphere, and also in the Mesosphere. Which among the following is correct about the ozone (O<sub>3</sub>)?
- Tropospheric ozone is good for humans
  - Stratospheric ozone is good for the humans
  - Equal ozone concentration is found in the stratosphere and troposphere
  - In the stratosphere, ozone concentration is less than the ozone concentration in the troposphere

24. The Pyramids of Egypt are made of .....rocks containing.. fossils  
 a. Granite, dinosaur b. Limestone, nummulites  
 c. Sandstone, reptile d. Breccia, plant
25. Dinosaurs dominated the earth during.....  
 a. Triassic, meteoritic impact b. Jurassic, Deccan volcanic eruption  
 c. Cretaceous, climate change d. All of the above
26. The marine fossils found in Himalayan rocks were deposited in  
 a. Atlantic Ocean b. Pacific Ocean c. Tethys Sea d. Arabian Sea
27. Which of the following is not a fossil  
 a. Egyptian Mummies b. Woolly mammoth c. Archaeopteryx d. Dinosaur
28. Conch (Shankh) used for religious ceremonies is the shell of  
 a Reptile b. Gastropod c. Foraminifera d. Ostracod
29. Woolly mammoth went extinct during by  
 a. Cretaceous b. Holocene c. Pleistocene d. Eocene
30. Which of the following is a suitable medium for preservation of fossils  
 a. Volcanic rocks b. Metamorphic rocks c. Amber, Ice d. Sandstone
31. The oldest fossil was found in the rocks belonging to  
 a. Hadean b. Archean c. Proterozoic d. Quaternary
32. In petroleum exploration, fossils are used to understand  
 a. Age and depositional environment of the rock  
 b. Quantity of oil  
 c. Quality of oil  
 d. Migration of oil
33.  $[\text{HCO}_3^-]$  and  $[\text{CO}_3^{2-}]$  of a seawater sample are 1.8 and 0.25 mM, respectively. What is the carbonate alkalinity (roughly in eq  $\text{kg}^{-1}$ ) of this sample?  
 a. 0.45 b. 2.05 c. 2.30 d. 2.55
34. A manganese nodule found at a deep ocean site has a radius of 6 cm. If this grew at a rate of 3 mm/10 years, when would it have been born?  
 a.  $2 \times 10^6$  years b.  $3 \times 10^6$  years c.  $2 \times 10^7$  years d.  $5 \times 10^5$  years
35. How is the concentration of dissolved organic matter ([DOC]) comparable to particulate organic matter ([POC]) in the open surface ocean?  
 a.  $[\text{DOC}] \geq [\text{POC}]$  b.  $[\text{DOC}] \leq [\text{POC}]$  c.  $[\text{POC}] \approx 10 [\text{DOC}]$  d.  $[\text{DOC}] \approx 10 [\text{POC}]$
36. What is the second most abundant anion in the ocean?  
 a.  $\text{Cl}^-$  b.  $\text{Na}^+$  c.  $\text{SO}_4^{2-}$  d.  $\text{HCO}_3^-$
37. Which one is a cold ocean current?  
 a. Brazil b. Canary c. Kuroshio d. Agulhas
38. Match column I (depth), column II (zone) and column III (processes) for marine sediments

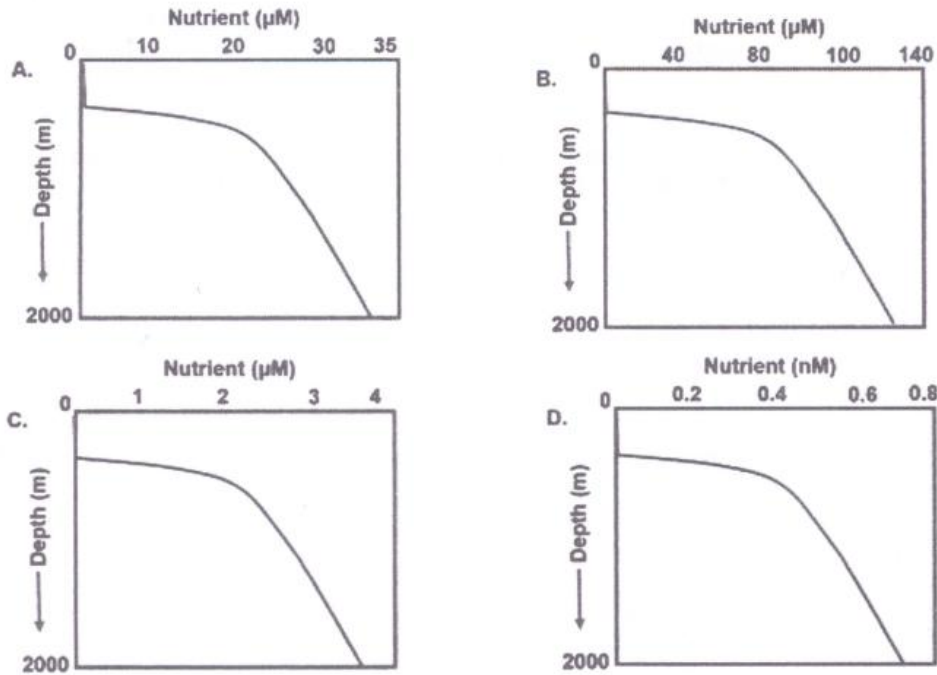
Depth		Zone		processes	
A	0–1 cm	D	Oxic	G	Nitrate reduction
B	1–10 cm	E	Anoxic	H	Oxygen respiration
C	10 cm – 10 m	F	Suboxic	I	Sulfate reduction

- a. A-D-G, B-E-H, C-F-I  
 c. A-D-G, B-F-I, C-E-H

- b. A-D-H, B-E-G, C-F-I  
 d. A-D-H, B-F-G, C-E-I

39. There are two particles, A and B, on the sea surface. The density of particle A is twice the density of seawater, while B has the same density as the seawater. If A's radius is thrice the radius of B, which of the following statements is correct.
- Sinking velocity of A is 9 times that of B.
  - Sinking velocity of A is 3 times that of B.
  - Sinking velocity of A is 18 times that of B.
  - A might get deposited in the sediments but B will not sink.
40. Why high nutrient low chlorophyll (HNLC) regions have high nitrate concentrations compared to other parts of the surface ocean?
- These regions do not receive light throughout the year so nitrate remains unconsumed by photosynthetic organisms.
  - These regions are limited by a micronutrient needed for photosynthesis.
  - High remineralization at surface leads to high nitrate.
  - Intense upwelling and colder currents bring nitrate to HNLC regions.
41. Which one of the following is correct representation of denitrification?
- $\text{NO}_3^- \rightarrow \text{NO}_2^- \rightarrow \text{NO} \rightarrow \text{N}_2\text{O} \rightarrow \text{N}_2$
  - $\text{NO}_3^- \rightarrow \text{NO}_2^- \rightarrow \text{N}_2\text{O} \rightarrow \text{NO} \rightarrow \text{N}_2$
  - $\text{NO}_3^- \rightarrow \text{NO}_2^- \rightarrow \text{N}_2\text{O} \rightarrow \text{N}_2$
  - $\text{NO}_3^- \rightarrow \text{NO}_2^- \rightarrow \text{NO} \rightarrow \text{N}_2\text{O} \rightarrow \text{N}_2 \rightarrow \text{NH}_3$
42. What is the preferred sequence of oxidants utilized by bacteria during the decomposition of organic matter?
- $\text{O}_2 > \text{NO}_3^- > \text{SO}_4^{2-} > \text{CO}_3^{2-}$
  - $\text{O}_2 > \text{NO}_3^- > \text{CO}_3^{2-} > \text{SO}_4^{2-}$
  - $\text{O}_2 > \text{SO}_4^{2-} > \text{CO}_3^{2-} > \text{NO}_3^-$
  - $\text{NO}_3^- > \text{SO}_4^{2-} > \text{CO}_3^{2-} > \text{O}_2$
43. The flux of  $\text{N}_2\text{O}$  out of the ocean is mostly concentrated in the up-welling areas and high latitudes because
- there is more  $\text{N}_2$  available in these regions.
  - the solubility of  $\text{N}_2\text{O}$  is less in these regions, so it escapes into the atmosphere.
  - the processes that produce  $\text{N}_2\text{O}$  are inhibited by light.
  - the winds are stronger in these regions and help the gas to go out.
44. Which one of the following is ultimate limiting nutrient (on geological time scales) for ocean productivity?
- Nitrogen
  - Phosphorus
  - Silicate
  - Iron
45. The extent to which the ocean takes up excess  $\text{CO}_2$  is NOT controlled by
- the capacity of  $\text{CO}_2$  absorption when the ocean is in equilibrium with the atmosphere.
  - the rate of  $\text{CO}_2$  exchange between atmosphere and surface ocean.
  - the rate at which surface water, having absorbed  $\text{CO}_2$ , is mixed in to the deeper layers.
  - the remineralization of organic matter in the deeper layers and burial of organic matter in the ocean sediments.
46. Which of the following planktonic groups DO NOT produce calcium carbonate ( $\text{CaCO}_3$ ) shells or skeletons?
- coccolithophores
  - foraminifera
  - pteropods
  - crocosphaera
47. All the ocean ice sheets store today 2% of the ocean water with an average oxygen isotopic composition (8180) of -55‰. What would be the 8180 (in ‰) of an ice-free ocean?
- 0
  - 0.5
  - 11
  - 1.1
48. Which one is a warm ocean current?
- Brazil
  - Canary
  - Benguela
  - Oyashio
49. The abundance of opal in deep sea sediments is closely related to the abundance (in the overlying waters) of
- diatoms only
  - radiolarians only
  - both the diatoms and radiolarians
  - planktonic and benthic foraminifera

50. Surface water at equilibrium with the air contains about  $0.25 \text{ moles /m}^3$  of  $\text{O}_2$ . How much  $\text{O}_2$  (in  $\text{mol m}^2$ ) a 40 m mixed layer will contain?  
a. 0.25                      b. 1                              c. 10                            d. 100
51. Given figures represent nutrient profiles at a site in the tropical Pacific Ocean. Which one of the following options correctly represents these nutrients?



- a. A-nitrate, B-phosphate, C-dissolved iron, D-silicate  
 b. A-silicate, B-phosphate, C-nitrate, D- dissolved iron  
 c. A-silicate, B-nitrate, C-nitrite, D- dissolved iron  
 d. A-nitrate, B-silicate, C-phosphate, D- dissolved iron

52. Assertion (A): When the dissolved oxygen contents of surface ocean waters are compared with those for saturation with the overlying air it is found that they are on the average supersaturated by several percent.  
 Reason (R): Phytoplankton living in surface water produce oxygen.  
 a. Both A and R are correct and R explains A correctly.  
 b. Both A and R are correct and A explains R correctly.  
 c. A is incorrect and R is correct.  
 d. Both A and R are correct and R does not explain A correctly.
53. Assertion (A): Roughly half of the oxygen that we breathe is produced by marine microorganisms.  
 Reason (R): Marine microorganisms have played a significant role in the oxygenation of our atmosphere in geological timescales.  
 a. Both A and R are correct and R explains A correctly.  
 b. Both A and R are correct.  
 c. A is incorrect and R is correct.  
 d. Both A and R are correct and R does not explain A correctly.
54. Ocean takes up around 25% of the anthropogenic  $\text{CO}_2$ . What is the primary reason behind this?  
 a. Phytoplankton consumes  $\text{CO}_2$  during photosynthesis in the surface ocean.  
 b. Increase in atmospheric  $\text{pCO}_2$  leads to more dissolution of  $\text{CO}_2$  in the ocean.  
 c. Increased sedimentation leads to more  $\text{CO}_2$  sequestration.  
 d. Zooplankton grazing has increased over time.

55. Sediment taken at a depth of 100 cm in a deep-sea core contains foraminifera shells with a  $^{14}\text{C}/\text{C}$  ratio 12.5% that for sediment from a depth of 10 cm. What is the apparent sedimentation rate (assuming  $^{14}\text{C}$  half-life = 6000 years)?  
 a. 0.05 mm/year                      b. 0.05 cm/year                      c. 0.05 m/year                      d. 0.0375 mm/year
56. The resistance offered by a stone against rubbing action is called  
 a. Rubbing resistance                      b. Abrasive resistance                      c. Frictional resistance                      d. Shear resistance
57. The soil sample is graded well, if  
 a. If it has the same size of most number of its particles  
 b. Good representation of all sizes of the particles  
 c. Excess of certain particles  
 d. None of the mentioned
58. Which rock possesses very high compressive strength?  
 a. Igneous    b. Sedimentary  
 c. Metamorphic    d. Sedimentary and metamorphic
59. The branch or study which deals with the behaviour of rocks under applied forces is called  
 a. Rock mechanics                      b. Soil mechanic                      c. Lithology                      d. Geology
60. Finest sediments in case of fluvial system can be obtained from the  
 a. Channel deposits                      b. flood plain deposits                      c. Overbank deposits                      d. All the above
61. A type of unconformity characterized by the occurrence of sedimentary rocks on igneous/metamorphic rocks is known as  
 a. Angular unconformity                      b. Nonconformity                      c. Paraconformity                      d. Disconformity
62. Partial melting and production of new ocean floor takes place at  
 a. Ocean-Ocean Convergent plate boundary                      b. Divergent plate boundary  
 c. Ocean-Continent Convergent plate boundary                      d. All of these
63. Which of the following is not a method of control of mass movement?  
 a. Afforestation    b. Retaining walls  
 c. Chemical treatment of rocks    d. Deforestation
64. Which type of dam usually has a triangular profile and can resist the forces by its own weight?  
 a. Gravity dam    b. Arch dam    c. Geotechnical dam    d. Embankment dam
65. The major problem in a reservoir over time which may affect the storage capacity is  
 a. Leakage    b. Silting  
 c. Reduction in rainfall    d. Weathering of side slopes
66. Type of hydropower tunnel where water is conveyed under gravity is  
 a. Discharge tunnel                      b. Pressure tunnel                      c. Supply tunnel                      d. Delivery tunnel
67. Which tunnel outline is preferred for weak rocks with unequal lateral pressure?  
 a. D-shaped    b. Horse-shoe shaped  
 c. Circular    d. Rectangular shaped
68. If the Earth is rotated from east to west instead of west to east, which one of the following is likely to change?  
 a. Distribution of high and low pressure belts.                      b. Magnitude of Coriolis force.  
 c. Direction of Coriolis deflection.                      d. Seasonal migration of ITCZ
69. Ocean western boundary currents are.  
 a. Warm currents in both the hemispheres  
 b. Cold currents in both hemispheres  
 c. Warm currents in the Northern and cold currents in the Southern Hemisphere  
 d. Cold currents in the Northern and warm currents in the Southern Hemisphere

70. Choose the pair of forces that are common to oceanic eddies and geostrophic currents  
 a. Pressure gradient force - Coriolis force  
 b. Coriolis force- Centrifugal force  
 c. Centrifugal force - gravitational force  
 d. Gravitational forces - pressure gradient force
71. The Monsoon trough is  
 a. Land-sea thermal contrast  
 b. Inter tropical convergence zone  
 c. Low pressure due to strong heating  
 d. Formation of strong low level winds
72. Climatic change due to greenhouse gasses favours  
 a. Reduction in short wave coming to earth atmosphere  
 b. Reduction in long waves coming to earth atmosphere  
 c. Reduction in long waves going out of atmosphere  
 d. Increase in the long wave going out of atmosphere
73. In the northern hemisphere, if strong westerly winds are blowing then what should be the nature of the pressure gradient  
 a. High pressure is in the east and low in the west  
 b. High pressure in the west and low in the east  
 c. High pressure in high latitudes and low pressure in low latitudes  
 d. High pressure in low latitudes, low pressure in high latitudes
74. Which one of the following is correct?  
 a. The specific heat of land is higher than ocean  
 b. The specific heat of ocean is higher than land  
 c. Specific heat of land and ocean are equal  
 d. None of the above
75. Which of the following features of the Indian summer monsoon circulation is FALSE?  
 a. The Somali Jet is centred at a height of 1.5 km  
 b. The Tropical Easterly Jet originates from the Mascarene high  
 c. The Subtropical Westerly Jet is climatologically located at 30°N  
 d. The Tropical Easterly Jet is normally located between 12°N and 15°N over India
76. The fraction of solar energy reflected from earth to space is known as  
 a. Insolation  
 b. Albedo  
 c. Irradiation  
 d. Heat loss
77. Which climate type is a direct result of air subsidence (sub-tropical high pressure belt)?  
 a. Desert  
 b. Tropical  
 c. Highland  
 d. Humid sub-tropical
78. Somali Jet is observed in  
 a. Lower troposphere  
 b. Mid troposphere  
 c. Upper troposphere  
 d. Stratosphere
79. Monsoon depression is  
 a. Higher pressure systems with anticyclone circulation  
 b. Lower pressure systems with anticyclone circulation  
 c. Lower pressure systems with cyclone circulation  
 d. Lower pressure systems with anticyclone circulation
80. El Niño is characterized by  
 a. a large-scale increase of the trade winds  
 b. a large scale weakening of the trade winds  
 c. No change in the trade winds  
 d. None of the above
81. Positive Indian Ocean Dipole is  
 a. The Western equatorial Indian Ocean has a warm anomaly and the eastern equatorial Indian Ocean has a cold anomaly.  
 b. The Eastern equatorial Indian Ocean has a warm anomaly and the Western equatorial Indian Ocean has a cold anomaly.  
 c. The Western equatorial Indian Ocean has a cold anomaly and the eastern equatorial Indian Ocean has a cold anomaly.  
 d. The Western equatorial Indian Ocean has a warm anomaly and the eastern equatorial Indian Ocean has a warm anomaly.



82. Which among the following is an important stratospheric ozone depleting agent?  
a. Chlorofluorocarbons                          b. NaCl  
c. Aerosols    d. Clouds
83. What is the maximum force expressed per unit area, which a stone can withstand without rupturing?  
a. Shear strength                          b. Tensile strength                          c. Compressive strength                          d. Bending strength
84. Which type of geological structure can be rectified by grouting?  
a. Joints    b. Folds    c. Faults    d. Inclined strata
85. Which of the following is not associated with glaciers?  
a. Drumlins    b. Varves    c. Eskers    d. Braid bars
86. Which of the following statements is TRUE in the case of Mid Oceanic Ridges (MOR)?  
a. Ocean floor basalt is younger with distance away from MOR  
b. Ocean floor basalt is older with distance away from MOR  
c. The depth of the ocean floor becomes less with distance from MOR  
d. The age and depth of the ocean floor remain unchanged with distance from MOR
87. The surface of discontinuity between older folded sedimentary strata and younger horizontal strata is known as  
a. Disconformity    b. Parallel unconformity  
c. unconformity    d. Nonconformity
88. Volcanic Islands are associated with  
a. Ocean-continent convergence                          b. Divergent plate boundaries  
c. Transform boundaries    d. Ocean-ocean convergence
89. Pneumatically applied mortar or concrete is called  
a. Grout    b. Gunite    c. Geo-polymer concrete                          d. Geniter
90. The type of dam where the forces acting on the dam are transmitted onto the abutment rocks is  
a. Gravity dam    b. Arch dam    c. Geotechnical dam                                  d. Embankment dam
91. Tunnels associated with hydropower generation are called  
a. Energy tunnels    b. Power tunnels  
c. Generation tunnels    d. Hydropower tunnels
92. A telescope  
a. Brings an object closer    b. Makes the object bigger  
c. Makes an image bigger    d. Enhances the image of an object
93. The brightest star in the night sky is:  
a. Sirius    b. Alpha Centauri    c. Betelgeuse    d. Polaris
94. Kepler's laws explain  
a. How meteors fall on earth    b. Why is the solar system stable  
c. Why the Sun burns so brightly    d. What is the trajectory of a planet
95. The changing weather of a planet depends on  
a. Inclination of its orbit    b. Distance from the host star  
c. How many planets are between it and its star    d. Its size
96. The first radio broadcast occurred 80 years ago. How far from Earth can it now be heard?  
a. At a star about 80 light years from us                          b. It cannot be heard at all  
c. At a star about 40 light years from us                          d. At a star about 120 light years from us



97. Which statement about the theory of relativity is false  
 a. It was formulated by Einstein  
 b. It explains how space and time work  
 c. It explains why stars are so hot  
 d. It explains that mass is a compact form of energy
98. Earth's magnetic field is  
 a. Static  
 b. Changes significantly over a few hundred years  
 c. Changes significantly over a few thousand years  
 d. Changes significantly over millions of years
99. Kinetic energy of planets going around the Sun are  
 a. Remains unchanged  
 b. Increases  
 c. Decreases  
 d. There is no relation between the two
100. What occurs due to the falling of big rock blocks or sides due to the release of stresses during tunnelling?  
 a. Rock fall  
 b. Rock bursts  
 c. Blockage  
 d. Water rush