

COMMON P. G. ENTRANCE TEST – 2023 (CPET-2023)

Test Booklet No. : . . .

003

Subject Code : **26**

Hall Ticket No. :

Subject : **MARINE SCIENCE(OCEANOGRAPHY)**

TEST BOOKLET

Time Allowed : **60 Minutes**

Full Marks : **80**

: INSTRUCTIONS TO CANDIDATES :

1. The Test Booklet contains **16** pages including the cover page and **80** (Question No. 1 to 80) multiple choice questions.
2. **DO NOT** break the seal of the Test Booklet until the invigilator instructs to do so.
3. The candidates must check discrepancy, if any (like up-printed or torn or missing pages or missing questions) in the Test Booklet immediately after breaking the seal of the Test Booklet. If detected, the invigilator may be requested to replace the same.
4. Candidates are required to fill up and darken the **Hall Ticket No, Test Booklet Serial No. and OMR Answer Sheet Serial No.** in attendance sheet carefully. Wrongly filled in OMR Answer Sheet is liable for rejection.
5. Each question has four choices / answers marked (A), (B), (C), (D). Candidate has to select the most appropriate choice / answer to each question and darken the oval completely against the question number provided in the OMR Answer Sheet.
6. Indicate only one choice / answer from the options provided by darkening the appropriate oval in the OMR Answer Sheet. More than one response to a question shall be treated as a wrong answer.
7. Use only **Black Ball Point Pen** for darkening the oval for answering.
8. All the questions are compulsory and they carry equal marks. The total marks scored by a candidate depends on the number of correct choices / answers darkened in the OMR Answer Sheet. There will be no negative marking for wrong answers.
9. No candidate shall be allowed to leave the Examination Hall / Room till all OMR Answer Sheets have been collected by the invigilator.
10. On completion of the entrance test, the original OMR Answer Sheet be handed over to the invigilator. Candidates are allowed to take the second copy of the OMR Answer Sheet along with the used Test Booklet for reference.
11. Candidates are not allowed to carry any personal belongings including electronic devices such as scientific calculator, cell phones, headphones, ear buds, or any other type of devices that allow communication of any kind inside the Examination Room / Hall.
12. The candidates are advised not to scribble or make any mark on the OMR Answer Sheet except marking the answers at the appropriate places and filling up the details required. Rough work, if any, may be done in the blank sheet(s) provided at the end of the Test Booklet.
13. Any malpractice / use of unfair means will lead to your disqualification from the entrance test / admission process and may also lead to appropriate legal action as deemed fit.

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

(Turn over)

PN – 26/17

SEAL

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1. Which of the following best defines Weathering ?
 - (A) The movement of sediment from one location to another
 - (B) The breaking down and wearing away of rocks and minerals
 - (C) The transportation of soil by wind or water
 - (D) The formation of new landforms by the deposition of sediment
2. Which of the following is an agent of erosion ?
 - (A) Deposition
 - (B) Compaction
 - (C) Glacier
 - (D) Oxidation
3. Which of the following is a consequence of climate change ?
 - (A) Decreased frequency of hurricanes
 - (B) Increased sea ice extent in the Arctic
 - (C) Rising global sea levels
 - (D) Expansion of polar ice caps
4. Which of the following measures is a measure of central tendency ?
 - (A) Standard deviation
 - (B) Range
 - (C) Median
 - (D) Variance
5. The range is a measure of :
 - (A) Variability
 - (B) Central tendency
 - (C) Spread
 - (D) Skewness
6. Which of the following measures describes the average squared deviation from the mean ?
 - (A) Variance
 - (B) Standard deviation
 - (C) Range
 - (D) Median
7. Which of the following is not a form of electromagnetic radiation ?
 - (A) X-rays
 - (B) Sound waves
 - (C) Gamma rays
 - (D) Radio waves

8. Which electromagnetic wave has the highest energy ?
- (A) Infrared radiation (B) Radio waves
(C) X-rays (D) Microwaves
9. Which of the following statements is true about the speed of electromagnetic waves in a vacuum ?
- (A) All electromagnetic waves travel at the same speed.
(B) Higher-frequency waves travel faster than lower-frequency waves.
(C) Lower-frequency waves travel faster than higher-frequency waves.
(D) The speed of electromagnetic waves depends on their amplitude.
10. Which of the following factors affects the orbital period of a satellite ?
- (A) Mass of the satellite
(B) Radius of the satellite
(C) Mass of the celestial body
(D) Distance between the satellite and the celestial body
11. Geo-stationary satellites are placed in orbits :
- (A) Close to Earth's surface (B) Above Earth's equator
(C) In polar orbits (D) At varying altitudes
12. Which of the following statements is true about the relationship between satellite altitude and orbital speed ?
- (A) Higher altitude requires higher orbital speed
(B) Higher altitude requires lower orbital speed
(C) Altitude does not affect orbital speed
(D) Orbital speed is independent of altitude

13. Which of the following factors does not affect the magnitude of friction between two objects ?
- (A) Mass of the objects (B) Surface area of contact
(C) Velocity of the objects (D) Roughness of the surfaces
14. Which of the following materials is typically the most elastic ?
- (A) Rubber (B) Steel
(C) Glass (D) Plastic
15. The measure of a material's elasticity is known as its :
- (A) Tensile strength (B) Ductility
(C) Young's modulus (D) Hardness
16. Which of the following is not a type of rock ?
- (A) Granite (B) Quartz
(C) Sandstone (D) Basalt
17. The process of changing sediment into rock through compaction and cementation is called :
- (A) Weathering (B) Erosion
(C) Metamorphism (D) Lithification
18. The theory of plate tectonics states that :
- (A) Earth's plates are fixed and immovable
(B) Earth's surface is covered by a single large plate
(C) Earth's lithosphere is divided into several large plates
(D) Earth's plates are composed entirely of oceanic crust
19. The boundary where two plates are moving away from each other is called a :
- (A) Convergent boundary (B) Transform boundary
(C) Divergent boundary (D) Sub-duction zone

20. Which of the following features is commonly associated with convergent plate boundaries ?
- (A) Rift valleys (B) Mid-ocean ridges
(C) Trenches (D) Transform faults
21. The process by which ocean water moves vertically, bringing nutrients to the surface, is called :
- (A) Upwelling (B) Downwelling
(C) Thermohaline circulation (D) Gyre circulation
22. Which of the following is not a major component of seawater ?
- (A) Sodium chloride (salt) (B) Oxygen gas (O_2)
(C) Carbon dioxide (CO_2) (D) Nitrogen gas (N_2)
23. Which of the following materials is the best conductor of heat ?
- (A) Wood (B) Plastic
(C) Glass (D) Metal
24. What is the primary environmental concerns associated with burning fossil fuels ?
- (A) Air pollution and greenhouse gas emissions
(B) Soil erosion and deforestation
(C) Water pollution and habitat destruction
(D) Ozone depletion and acid rain
25. The rotational analog of Newton's second law of motion is given by :
- (A) $F = ma$ (B) $F = mv$
(C) $\tau = I\alpha$ (D) $\tau = mg$

26. Which of the following is the general formula for alkanes ?
- (A) C_nH_{2n+2} (B) C_nH_{2n}
(C) C_nH_n (D) C_nH_{n+1}
27. The boiling points of alkanes generally :
- (A) Decrease with increasing carbon chain length
(B) Increase with increasing carbon chain length
(C) Remain constant regardless of the carbon chain length
(D) Vary randomly depending on the carbon chain length
28. The most recent Era in the geological time scale is :
- (A) Paleozoic Era (B) Mesozoic Era
(C) Cenozoic Era (D) Pre-cambrian Era
29. The Pre-cambrian Era represents :
- (A) The Era before the existence of life on Earth
(B) The Era when dinosaurs roamed the Earth
(C) The Era when mammals evolved
(D) The Era of human civilization
30. What does CPU stand for in the context of a computer ?
- (A) Computer Processing Unit (B) Central Processing Unit
(C) Computer Power Unit (D) Central Power Unit
31. What does URL stand for in the context of the internet ?
- (A) Universal Resource Locator (B) Uniform Resource Locator
(C) Universal Reference Locator (D) Uniform Reference Locator

32. The correlation coefficient ranges between :
- (A) -1 and 1 (B) 0 and 1
(C) $-\infty$ and ∞ (D) 1 and 10
33. In a scatter plot, a positive correlation is indicated by :
- (A) Data points forming a horizontal line
(B) Data points forming a vertical line
(C) Data points forming an upward sloping line
(D) Data points forming a downward sloping line
34. The equation of a straight line passing through the points $(2, 5)$ and $(4, 9)$ is given by :
- (A) $y = 2x + 1$ (B) $y = 2x + 5$
(C) $y = 4x + 1$ (D) $y = 4x + 5$
35. The Earth's outermost layer, the crust, is primarily composed of :
- (A) Iron and nickel (B) Silicates and oxides
(C) Liquid magma (D) Water and ice
36. Which layer of the Earth is responsible for generating the planet's magnetic field ?
- (A) Crust (B) Mantle
(C) Outer core (D) Inner core
37. Which gas is responsible for the greenhouse effect and helps regulate the Earth's temperature ?
- (A) Oxygen (B) Carbon dioxide
(C) Nitrogen (D) Ozone

38. The layer of the atmosphere where the ozone layer is located is called the :
- (A) Stratosphere (B) Troposphere
(C) Mesosphere (D) Thermosphere
39. Non-metals generally have :
- (A) High melting points (B) High electrical conductivity
(C) Low reactivity (D) Ductile properties
40. Which of the following alkanes would have the highest boiling point ?
- (A) Methane (CH_4) (B) Ethane (C_2H_6)
(C) Propane (C_3H_8) (D) Butane (C_4H_{10})
41. Which of the following factors can negatively impact marine ecosystems ?
- (A) Increased biodiversity (B) Population from oil spills
(C) Decreased water temperature (D) Excessive sunlight exposure
42. The Gulf Stream is an example of a :
- (A) Warm ocean current (B) Cold ocean current
(C) Equatorial current (D) Deep ocean current
43. Which endangered species is known to nest in the coastal areas of Odisha ?
- (A) Olive Ridley sea turtles (B) Bengal tigers
(C) Asian elephants (D) Indian rhinoceros
44. What is the logarithm of 1 ?
- (A) 0 (B) 1
(C) -1 (D) Undefined

45. What is the value of $(2^2)^3$?
- (A) 4 (B) 8
(C) 16 (D) 64
46. What is the maximum number of solutions a quadratic equation can have ?
- (A) 0 (B) 1
(C) 2 (D) 3
47. Which of the following factors does not affect the solubility of a solid solute in a liquid solvent ?
- (A) Temperature (B) Pressure
(C) Particle size of the solute (D) Polarity of the solvent
48. What does the term "miscible" mean in the relation to liquid solvents ?
- (A) The liquids can dissolve each other in any proportion.
(B) The liquids do not mix and separate into distinct layers
(C) The liquids have a low solubility in each other.
(D) The liquids have a high viscosity and do not flow easily.
49. Which of the following is an example of a metallic mineral ?
- (A) Gypsum (B) Fluorite
(C) Feldspar (D) Copper
50. Which process is used to extract metals from their ores ?
- (A) Sedimentation (B) Filtration
(C) Smelting (D) Distillation
51. Which of the following is not a commonly used fuel in nuclear power plants ?
- (A) Uranium-235 (B) Plutonium-239
(C) Thorium-232 (D) Carbon-14

52. Which component of a nuclear power plant is responsible for slowing down neutrons to sustain a nuclear chain reaction ?
- (A) Control rods (B) Moderator
(C) Coolant (D) Fuel rods
53. Which fossil fuel is primarily composed of ancient plant matter that has been buried and subjected to heat and pressure over millions of years ?
- (A) Coal (B) Natural gas
(C) Oil (D) Peat
54. Which is the main component of natural gas ?
- (A) Methane (B) Carbon dioxide
(C) Ethane (D) Propane
55. What is the formula for kinetic energy ?
- (A) $KE = mv$ (B) $KE = mgh$
(C) $KE = \frac{1}{2}mv^2$ (D) $KE = Fd$
56. What is the formula for calculating the pH of a solution ?
- (A) $pH = -\log[H^+]$ (B) $pH = \log[H^+]$
(C) $pH = [H^+]/\log$ (D) $pH = [H^+] \times \log$
57. The refractive index of a medium determines the :
- (A) Intensity of light (B) Angle of incidence
(C) Angle of refraction (D) Speed of light in that medium
58. What is the main source of human-generated carbon dioxide emissions ?
- (A) Industrial processes (B) Volcanic eruptions
(C) Deforestation (D) Natural gas leaks

59. Which sector contributes the most to global greenhouse gas emissions ?
- (A) Agriculture and livestock (B) Transportation
- (C) Energy production (D) Waste management
60. Which electromagnetic wave has the shortest wavelength ?
- (A) Radio waves (B) Visible light
- (C) Ultraviolet rays (D) Microwaves
61. What is the escape velocity ?
- (A) The velocity required for a satellite to enter orbit
- (B) The velocity at which a satellite orbits Earth
- (C) The velocity required for a satellite to escape Earth's gravitational pull
- (D) The velocity at which a satellite re-enters Earth's atmosphere
62. The elastic limit of a material is defined as the point at which :
- (A) It breaks or fractures
- (B) It becomes permanently deformed
- (C) It reaches its maximum stress
- (D) It loses its elastic properties
63. Minerals are naturally occurring substances that :
- (A) Can be human made
- (B) Are always organic in origin
- (C) Have a specific chemical composition and crystal structure
- (D) Are only found on Earth's surface

64. The process by which one tectonic plate sinks beneath into the mantle is called :

(A) Seafloor spreading

(B) Continental drift

(C) Subduction

(D) Transform faulting

65. The study of the ocean floor and its features is known as :

(A) Marine biology

(B) Oceanography

(C) Marine geology

(D) Physical oceanography

66. Which of the following is an example of an alkane ?

(A) Ethanol

(B) Ethene

(C) Methane

(D) Acetylene

67. Which of the following is an example of an input device ?

(A) Printer

(B) Monitor

(C) Keyboard

(D) Speaker

68. Regression analysis is used to :

(A) Determine the strength of correlation

(B) Establish causation between variables

(C) Predict the value of one variable based on another variable

(D) Determine the direction of the relationship between variables

69. The equation of a straight line is given by $y = 2x + 3$. What is the slope of this line ?

(A) 2

(B) 3

(C) -2

(D) -3

70. The lithosphere is primarily composed of :

(A) Solid rock and minerals

(B) Molten lava and magma

(C) Water and ice

(D) Organic matter and sediment

71. The layer of the atmosphere closest to the Earth's surface is called the :
(A) Stratosphere (B) Troposphere
(C) Mesosphere (D) Thermosphere
72. Which layer of the atmosphere is characterized by increasing temperatures with altitude due to the absorption of solar radiation ?
(A) Troposphere (B) Stratosphere
(C) Mesosphere (D) Thermosphere
73. Metals tend to lose electrons and form :
(A) Positive ions (cations) (B) Negative ions (anions)
(C) Covalent bonds (D) Non-polar molecules
74. Which of the following is a metalloid ?
(A) Aluminum (B) Bromine
(C) Silicon (D) Sulfur
75. Which of the following organisms plays a crucial role in converting sunlight into energy through photosynthesis in marine ecosystems ?
(A) Sharks (B) Sea turtles
(C) Seaweed (D) Octopuses
76. What is the primary source of energy for most marine ecosystems ?
(A) Soil nutrients (B) Atmospheric gases
(C) Solar energy (D) Organic matter from land
77. What does it mean if a solution is saturated ?
(A) It contains a high concentration of solute.
(B) It cannot dissolve any more solute at a given temperature.
(C) It contains only a small amount of solute.
(D) It is a mixture of two immiscible liquids.

78. Which mineral is the primary source of aluminum ?

(A) Quartz

(B) Hematite

(C) Bauxite

(D) Dolomite

79. What is the main advantage of nuclear energy compared to fossil fuels ?

(A) Nuclear energy produces fewer greenhouse gas emissions.

(B) Nuclear energy is cheaper to produce.

(C) Nuclear energy is more abundant.

(D) Nuclear energy is easily renewable.

80. What is the formula for calculating percent yield ?

(A) $\text{Percent yield} = (\text{actual yield} / \text{theoretical yield}) \times 100\%$

(B) $\text{Percent yield} = (\text{theoretical yield} / \text{actual yield}) \times 100\%$

(C) $\text{Percent yield} = (\text{actual yield} - \text{theoretical yield}) \times 100\%$

(D) $\text{Percent yield} = (\text{theoretical yield} - \text{actual yield}) \times 100\%$



SPACE FOR ROUGH WORK

SEAL

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