

HIGHER EDUCATION DEPARTMENT, GOVT. OF ODISHA

TEST BOOKLET

Subject Code : 20

Entrance Subject : ENVIRONMENTAL SCIENCE

Time Allowed: 90 Minutes

Full Marks : 70

INSTRUCTIONS TO CANDIDATES

1. Please do not open this Question Booklet until asked to do so.
2. Check the completeness of the Question Booklet immediately after opening.
3. Enter your Hall Ticket No. on the Test Booklet in the box provided alongside. Do not write anything else on the Test Booklet.
4. Fill up & darken Hall Ticket No. & Test Booklet No. in the Answer Sheet as well as fill up Test Booklet Serial No. & Answer Sheet Serial No. in the Attendance Sheet carefully. Wrongly filled up Answer Sheets are liable for rejection.
5. Each question has four answer options marked (A), (B), (C) & (D).
6. Answers are to be marked on the Answer Sheet, which is provided separately.
7. Choose the most appropriate answer option and darken the oval completely, corresponding to (A), (B), (C) or (D) against the relevant question number.
8. Use only Blue/Black Ball Point Pen to darken the oval for answering.
9. Please do not darken more than one oval against any question, as scanner will read such markings as wrong answer.
10. Each question carries equal marks. There will be no negative marking for wrong answer.
11. Electronic items such as calculator, mobile, etc. are not permitted inside the examination hall.
12. Don't leave the examination hall until the test is over and permitted by the invigilator.
13. The candidate is required to handover the original OMR sheet to the invigilator and take the question booklet along with the candidate's copy of OMR sheet after completion of the test.
14. Sheet for rough work is appended in the Test Booklet at the end.

SE

1. Eutrophication causes reduction in
 - (A) Nutrients
 - (B) Dissolved salts
 - (C) Dissolved oxygen
 - (D) All of these
2. Which of the following shows the correct relationship BOD and COD?
 - (A) $COD/BOD \geq 21$
 - (B) $COD/BOD \leq 1$
 - (C) $COD/BOD = 2$
 - (D) COD and BOD are independent from each other
3. BOD is primarily removed during which stage of water treatment?
 - (A) Primary
 - (B) Secondary
 - (C) Tertiary
 - (D) None of these
4. In which of the atmospheric layer, most of the gases are ionized?
 - (A) Troposphere
 - (B) Stratosphere
 - (C) Thermosphere
 - (D) Mesosphere
5. Which of the following types of cloud occurs at the highest altitude?
 - (A) Cumulonimbus
 - (B) Stratus
 - (C) Cumulous
 - (D) Cirrus
6. Which of the following is true about Ozone?
 - (A) Stratospheric ozone is responsible for the formation of photochemical smog
 - (B) Tropospheric ozone is responsible for the formation of photochemical smog
 - (C) Tropospheric ozone absorbs UV radiation from sun and protects earth
 - (D) None of the above

7. Which among the following has maximum global warming potential in a 20 year time horizon?
- (A) Methane (CH_4)
 - (B) Chloro-fluro carbon (CF_2Cl_2)
 - (C) Nitrous Oxide (N_2O)
 - (D) Carbon dioxide (CO_2)
8. Surface litter layer on ground soil is also known as
- (A) 'O' horizon
 - (B) A' horizon
 - (C) 'B' horizon
 - (D) 'C' horizon
9. Correct arrangement in order of decreasing soil particle size
- (A) Sand, Clay, Silt
 - (B) Clay, Silt, Sand,
 - (C) Silt, Sand, Clay
 - (D) Sand, Silt, Clay
10. Pyrolysis of Solid Waste refers to
- (A) High temperature aerobic combustion of waste for energy generation
 - (B) High temperature anaerobic carbonization of waste for energy generation
 - (C) Ambient temperature aerobic carbonization
 - (D) Ambient temperature anaerobic combustion
11. Which one of the following organisms is a free living nitrogen fixer.
- (A) Rhizobium
 - (B) Azotobacter
 - (C) Frankia
 - (D) Dory limes
12. Which of the following bacterium converts ammonia to nitrites?
- (A) Nitrosomonas
 - (B) Nitrobacter
 - (C) Nitrococcus
 - (D) Nostoc

13. The dominant gas in biogas is
- (A) CH_4
 - (B) C_2H_5
 - (C) H_2S
 - (D) C_4H_{10}
14. Gammexane is a formulation based on?
- (A) DDT
 - (B) Dichloro diphenyl toluene
 - (C) Chlorobenzene
 - (D) Benzene hexachloride
15. What is the full form of EIA?
- (A) Environmental Investigation Assessment
 - (B) Ecological Investigation Assessment
 - (C) Environmental Impact Assessment
 - (D) Ecological Impact Assessment
16. Which one of the following is associated with the issue of control and phasing out of the use of ozone-depleting substances?
- (A) Ramsar Convention
 - (B) Montreal Protocol
 - (C) Kyoto Protocol
 - (D) Nagoya Protocol
17. The pollutant involved in the Minamata Disease of Japan is
- (A) Cadmium
 - (B) Lead
 - (C) Mercury
 - (D) Arsenic

18. A local population genetically, structurally and functionally adapted to its local environment is called
- (A) Ecotype
 - (B) Ecophene
 - (C) Ecad
 - (D) Ecocline
19. Niche of an organism is its
- (A) Habitat
 - (B) Micro-habitat
 - (C) Hot Spot
 - (D) Range
20. With reference to food chains in ecosystems, which of the following statement is correct?
- (A) A food chain illustrates the order in which a chain of organisms feed upon each other.
 - (B) Food chains are found within the populations of a species.
 - (C) A food chain illustrates the numbers of each organism which are eaten by others.
 - (D) All the choices are correct
21. Which of the following is not true about "Climax Community"?
- (A) It has a wide diversity of species
 - (B) The climax vegetation is intolerant of environmental changes
 - (C) The life forms of the climax community indicate the climate type of an ecosystem.
 - (D) Individuals in the climax stage are replaced by other individuals of same kind.
22. Exponential growth in a population occurs
- (A) When there is a great environmental resistance
 - (B) When there is no environmental resistance
 - (C) When there is a fixed carrying capacity
 - (D) When there is no biotic potential

23. Bacterial leaf blight of rice caused by *Xanthomonas oryzae* can be identified by
- (A) Wilting of the plant
 - (B) Yellowing of leaves
 - (C) Ooze test
 - (D) Defoliation
24. The reaction centre of Photosystem-I is: -
- (A) P₆₈₀
 - (B) P₆₄₅
 - (C) P₇₀₀
 - (D) P₆₆₃
25. Which of the following parts of coconut is edible.
- (A) Endocarp
 - (B) Endosperm
 - (C) Mesocarp
 - (D) Epicarp
26. The breathing roots in mangrove plants are known as
- (A) Pneumatophores
 - (B) Stilt roots
 - (C) Prop roots
 - (D) Buttress root
27. In *Nepenthes* (pitcher plant), the pitcher is formed due to modification of:
- (A) Leaf petiole
 - (B) Leaf lamina
 - (C) Tendril
 - (D) Leaflets
28. Pteridophytes belong to kingdom Plantae and are characterized by the presence of
- (A) Root, having vascular tissue and having flowers
 - (B) Root and having vascular tissue but not having flowers
 - (C) Root, having flowers and without having vascular tissue
 - (D) Vascular tissue and having flowers but without having roots

29. The leaves of *Mimosa pudica* close when touched; this is an example of
- (A) Thigmotropism
 - (B) Seismonasty
 - (C) Geotropism
 - (D) Nyctinasty
30. Lignocellulose is the main structural component of plant cell walls. It is composed of
- (A) Lignin only
 - (B) Cellulose only
 - (C) Lignin and Cellulose
 - (D) Lignin, Cellulose and Hemi-cellulose
31. Swimming for a long time in salt water makes skin of one's fingertips wrinkled. Which one of the following properties is responsible for this observation?
- (A) Osmosis
 - (B) Dialysis
 - (C) Electro dialysis
 - (D) Coagulation
32. The difference between blood and lymph:
- (A) Blood has both RBC and WBC while lymph has only WBC
 - (B) Blood has both RBC and WBC while lymph has only RBC
 - (C) Blood has both RBC and WBC while lymph has none of these
 - (D) Blood has both cells and clotting factors while lymph has only clotting factors
33. Muscles and organ systems are derivatives of
- (A) Ectoderm
 - (B) Mesoderm
 - (C) Endoderm
 - (D) Endoderm and Mesoderm both

34. Analogous structures are?
- (A) Structurally similar
 - (B) Functionally similar
 - (C) Structurally and functionally similar
 - (D) Normally nonfunctional
35. Which of the following is false about cancer?
- (A) Carcinoma is the malignant growth of the epithelial tissue
 - (B) Sarcoma is the malignant growth of the connective tissue
 - (C) Lymphoma is the malignant growth of the lymphatic tissue
 - (D) Adenoma is the malignant growth abdomen tissue
36. Which of the following hormones contains iodine?
- (A) Testosterone
 - (B) Adrenaline
 - (C) Thyroxine
 - (D) Insulin
37. Cold blooded animal is the one which has:
- (A) Low temperature blood
 - (B) Low temperature habitat
 - (C) No regulatory system of body temperature
 - (D) Regulatory system of body temperature
38. Carrier of genes of colour blindness is
- (A) Mother
 - (B) Father
 - (C) Father and Mother both
 - (D) None of these
39. Which among the following genus **does not** belong to the family Malvaceae?
- (A) Gossypium
 - (B) Hibiscus
 - (C) Bombax
 - (D) Cassia

40. It different categories of threatened species are written in a sequence of their decreasing population size, what is the correct order?
- (A) Extinct → Vulnerable → Rare → Endangered
 - (B) Vulnerable → Rare → Endangered → Extinct
 - (C) Vulnerable → Rare → Extinct → Endangered
 - (D) Rare → Vulnerable Endangered → Extinct
41. What is the reserve food in plant cells?
- (A) Sucrose
 - (B) Starch
 - (C) Cellulose
 - (D) Glycogen
42. Which of the following set of membrane bound structures contain DNA
- (A) Nucleus, Ribosome, Golgi body
 - (B) Mitochondria, Chloroplast, Ribosome
 - (C) Nucleus, Lysosome, Ribosome
 - (D) Mitochondria, Chloroplast, Nucleus
43. Western blot is a technique to -
- (A) Transfer proteins from gels to membranes
 - (B) Transfer DNA from gels to membranes
 - (C) Transfer RNA from gels to membranes
 - (D) All of the above
44. Which of the following is not required for polymerase chain reaction (PCR)?
- (A) Restriction endonuclease enzyme
 - (B) Primer sequence
 - (C) Tag DNA polymerase enzyme
 - (D) DNA
45. Ascorbic acid is also known as:
- (A) Vitamin A
 - (B) Vitamin B1
 - (C) Vitamin C
 - (D) Vitamin D

46. Haem of the haemoglobin molecule is called its:
- (A) Coenzyme
 - (B) Prosthetic group
 - (C) Apoenzyme
 - (D) Inorganic factor
47. Epimers are
- (A) Optical isomers which are mirror images of each other
 - (B) Optical isomers which are not mirror images of each other
 - (C) Optical isomers that differ in muta-rotation
 - (D) Diastereomers differing only in the configuration around a single carbon atom
48. If a C-14 has a half-life of 5730 years, then how long will it take for quantity of C-14 in a sample to drop to 1/8 of initial quantity?
- (A) 2.58×10^4 years
 - (B) 1.72×10^4 years
 - (C) 1.44×10^4 years
 - (D) 1.14×10^4 years
49. Highest oxidation state of sulphur is found in which of the following compound?
- (A) H_2SO_4
 - (B) H_2S
 - (C) $\text{Na}_2\text{S}_2\text{O}_3$
 - (D) S_8
50. A 5 molar solution of H_2SO_4 is diluted from 1 liter to 10 liters. What will be the normality of resulting solution?
- (A) 0.25 N
 - (B) 0.5 N
 - (C) 0.75 N
 - (D) 1N

51. Elements in the same vertical group of the periodic table have same
- (A) Number of orbitals
 - (B) Number of neutrons in the nucleus
 - (C) Number of valence electrons
 - (D) Number of protons in the nucleus
52. ${}_{92}\text{U}^{235}$ belongs to group III B of the periodic table. If it loses one α particle the new element will belong to the group
- (A) IB
 - (B) IIB
 - (C) III B
 - (D) IA
53. Which radioactive element is considered as an indoor pollutant?
- (A) Oxygen - 18
 - (B) Nitrogen - 15
 - (C) Carbon -13
 - (D) Radon
54. A catalyst in a chemical reaction
- (A) Increases the average kinetic energy of molecules
 - (B) Increases the activation energy
 - (C) Decreases the activation energy
 - (D) Decreases the average kinetic energy of molecules
55. What is the average salinity of seawater?
- (A) 35 parts per hundred
 - (B) 35 parts per thousand
 - (C) 35 parts per million
 - (D) 35 parts per billion

56. Which of the following mineral has got highest hardness according to Moh's scale?
- (A) Corundum
 - (B) Topaz
 - (C) Quartz
 - (D) Diamond
57. Which of the following is an example of metamorphic rock?
- (A) Granite
 - (B) Gneiss
 - (C) Gabbro
 - (D) Granodiorite
58. A ring-shaped island of coral reefs enclosing, a shallow lagoon is known as
- (A) Barrier island
 - (B) Barrier reef
 - (C) Fringing Reefs
 - (D) Atoll
59. The innermost layer of the earth is made up of:
- (A) Liquid Silicon and Iron
 - (B) Solid Silicon and Iron
 - (C) Liquid Nickel and Iron
 - (D) Solid Nickel and Iron
60. Which of the following types of coal has lowest water content?
- (A) Anthracite
 - (B) Bituminous
 - (C) Sub-bituminous
 - (D) Lignite
61. Cinnabar is an ore of
- (A) Cupper
 - (B) Mercury
 - (C) Iron
 - (D) Cobalt

62. Which of the following is correct about Indian Monsoon?
- (A) North Eastern monsoon brings rain over India, during June-August.
 - (B) South Western monsoon causes rain at Tamil Nadu Coast, during November
 - (C) South western monsoon brings rain over India, during June-August.
 - (D) North Eastern monsoon causes rain at Tamil Nadu Coast, during Jun-Aug.
63. Formation of rainbows involves
- (A) Dispersion and total internal reflection
 - (B) Dispersion only
 - (C) Dispersion and diffraction
 - (D) Dispersion and Scattering
64. The work done by the centripetal force for a body moving in a circular path is.....?
- (A) Negative
 - (B) Zero
 - (C) Constant
 - (D) Positive
65. Curie temperature is the temperature above which
- (A) A ferromagnetic material becomes paramagnetic
 - (B) A ferromagnetic material becomes diamagnetic
 - (C) A paramagnetic material becomes diamagnetic
 - (D) A paramagnetic material becomes ferromagnetic
66. The gravitational force between two objects is f . If masses of both the objects are halved without altering the distance between them, then the gravitational force will become
- (A) $F/2$
 - (B) $F/4$
 - (C) The same i.e. F
 - (D) $2F$

67. The Geometric Mean and Arithmetic Mean of the following data set (1,3,9,3) are
- (A) Both are 4
 - (B) Both are 3
 - (C) 3 and 4 respectively
 - (D) 4 and 3 respectively
68. The sum of the deviations about the mean is always:
- (A) Positive
 - (B) Negative
 - (C) Equal to the standard deviation
 - (D) Zero
69. If the probability that an object dropped from a certain height will strike the ground is 80 percent and if 12 objects are dropped from the same place, find the mean and variance.
- (A) 9.6,1.92
 - (B) 8.6,1.92
 - (C) 9.6,1.82
 - (D) 8.6,1.82
70. The Chi square test can be equal to zero when:
- (A) Expected values are greater than the observed ones
 - (B) Expected values are less than the observed ones
 - (C) Expected values are equal to the observed ones
 - (D) Expected values are double than the observed ones
