

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

Test Booklet No. : - - -

Subject Code : **12**

Hall Ticket No. : - - -

0075

Subject : **ENVIRONMENTAL SCIENCE**

TEST BOOKLET

Time Allowed : 60 Minutes

Full Marks : 80

: INSTRUCTIONS TO CANDIDATES :

1. The Test Booklet contains **15** 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

PN – 12/16

(Turn over)

SEAL

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1. Which among the following statements is correct about ecosystem ?
 - (A) Flow of energy is cyclic
 - (B) Flow of matter is unidirectional
 - (C) Flow of energy is unidirectional
 - (D) The availability of energy increases successively through trophic levels

2. Which among the following is a Ramsar site?
 - (A) Chilka Lake
 - (B) Simlipal Biosphere Reserve
 - (C) Namdapha National Park
 - (D) Jim Corbett National Park

3. Fly ash is a pollutant released mostly from which industry ?
 - (A) Chlor-alkali plants
 - (B) Coal-based thermal power plants
 - (C) Sugar Industries
 - (D) Tanneries

4. The "Tikka" disease of ground nut is caused by :
 - (A) **Albugo candida**
 - (B) **Claveiceps purpurea**
 - (C) **Colletotrichum falcatum**
 - (D) **Cercospora personata**

5. Which among the following act as pioneer of succession in a xeric environment?
 - (A) Pteridophytes
 - (B) Bryophytes
 - (C) Gymnosperms
 - (D) Crustose Lichens

6. Which wave is not related to earthquakes ?
 - (A) Love wave
 - (B) S – wave
 - (C) P – wave
 - (D) Breaking wave

7. Which rock has the least silica content ?
 - (A) Granite
 - (B) Peridotite
 - (C) Gabbro
 - (D) Diorite

8. Which rock is not a metamorphic rock?
- (A) Marble (B) Phyllite
(C) Slate (D) Chalk
9. Fjords are the results of erosion by :
- (A) Running water (B) Glacier
(C) Wind (D) Ground water
10. What is the most abundant mineral in Earth's crust ?
- (A) Apatite (B) Feldspar
(C) Mica (D) Biotite
11. Calcite belongs to which crystal system ?
- (A) Hexagonal (B) Orthorhombic
(C) Tetragonal (D) Cubic
12. Earth's first single-celled life is believed to be formed in :
- (A) River (B) Ocean
(C) Desert (D) Atmosphere
13. Bauxite is an ore of :
- (A) Zinc (B) Copper
(C) Aluminium (D) Uranium
14. Which among the following is the correct order of evolution of life ?
- (A) Plants – Mammals – Amphibians – Dinosaurs
(B) Dinosaurs – Amphibians – Plants – Mammals
(C) Plants – Amphibians – Dinosaurs – Mammals
(D) Amphibians – Plants – Dinosaurs – Mammals
15. Himalayan Mountain Range is the result of :
- (A) Oceanic-continental convergence
(B) Oceanic-oceanic convergence
(C) Continental-continental convergence
(D) Transform fault

16. In which geological period *Glossopteris* was dominant?
- (A) Cambrian (B) Permian
(C) Jurassic (D) Cretaceous
17. Which one of the following is the correct arrangement of minerals according to their decreasing order of hardness?
- (A) Quartz – Corundum – Gypsum – Talc
(B) Corundum – Feldspar – Fluorite – Quartz
(C) Corundum – Quartz – Fluorite – Talc
(D) Quartz – Feldspar – Corundum – Talc
18. Name the correct orbital for the set of quantum numbers $n = 3, l = 2, m = -1$:
- (A) $3 d_{xy}$ (B) $2 p_y$
(C) $3 d_{yz}$ (D) $3 d_z^2$
19. The maximum numbers of 90° angles between bond pairs – bond pairs of electron is observed in:
- (A) sp^3d^2 hybridization (B) sp^3d hybridization
(C) dsp^2 hybridization (D) dsp^3 hybridization
20. The oxidation state of chromium in $Cr(CO)_6$ is:
- (A) 0 (B) +2
(C) -2 (D) -6
21. Which of the following is the most acidic in water?
- (A) CH_4 (B) NH_3
(C) CH_3COOH (D) HF
22. The numbers of unshared electrons on the Carbene carbon is:
- (A) 1 (B) 2
(C) 3 (D) 4

23. In photohalogenation of alkanes, the order of reactivity of the halogen is :
- (A) $I > Br > Cl$ (B) $Cl > I > Br$
(C) $Cl > Br > I$ (D) $Br > Cl > I$
24. Which among the following is the most potent inhibitor of nitrogenase ?
- (A) SO_2 (B) O_2
(C) CO_2 (D) CH_4
25. Which of the following is the smallest aromatic species ?
- (A) Cyclopropene (B) Cyclopropenyl cation
(C) Cyclopropenyl anion (D) Cyclobutadiene
26. When a liquid boils, there occurs an increase in :
- (A) Entropy (B) Heat of vapourization
(C) Free energy (D) Vapour pressure
27. When a gas undergoes reversible adiabatic expansion, ΔS of the gas is :
- (A) +ve (B) -ve
(C) Zero (D) Zero, only if the gas is ideal
28. The rate at which a substance reacts is proportional to :
- (A) Its atomic weight (B) Its molecular weight
(C) Its equivalent weight (D) Its active mass
29. The molecule that does not possess a permanent dipole moment is :
- (A) NF_3 (B) BF_3
(C) CH_2Cl_2 (D) NO_2

30. The change in entropy is always :
- (A) positive in a reversible change
 - (B) negative in a reversible change
 - (C) positive in an irreversible change
 - (D) negative in an irreversible change
31. A 100 g sample of radioactive element has a half-life of 10 days. How many grams of radioactive material will remain after 20 days?
- (A) 25.0 g
 - (B) 12.5 g
 - (C) 2.0 g
 - (D) 0.0 g
32. Which experiment has confirmed the existence of matter wave ?
- (A) Franck-Hertz Experiment
 - (B) Davisson-Germer Experiment
 - (C) Stern-Gerlach Experiment
 - (D) Michelson-Morley Experiment
33. Which property of liquid is responsible for opposing relative motion between its different layers ?
- (A) Surface tension
 - (B) Excess Pressure
 - (C) Capillarity
 - (D) Viscosity
34. The maximum efficiency of a full-wave rectifier is :
- (A) 40.6%
 - (B) 81.2%
 - (C) 90%
 - (D) 60%
35. The shape of the orbit of the Earth around the Sun is :
- (A) parabola
 - (B) hyperbola
 - (C) ellipse
 - (D) circle

36. Colour in the soap bubble seen during daytime is due to :
- (A) refraction of light (B) diffraction of light
(C) polarization of light (D) interference of light
37. The maximum kinetic energy of photo-electrons emitted from a given target depends on :
- (A) intensity of incident light (B) frequency of incident light
(C) angle of incidence of incident light (D) speed of incident light
38. The divergence of magnetic field is always :
- (A) positive (B) negative
(C) zero (D) one
39. Which spectral series of Hydrogen atom is found in visible region ?
- (A) Lyman series (B) Balmer series
(C) Paschen series (D) Brackett series
40. Guttation takes place through :
- (A) hydathode (B) stomata
(C) lenticel (D) plasmodesmata
41. Lichens can act as an indicator of :
- (A) SO_2 pollution (B) mercury pollution
(C) chromium pollution (D) lead pollution
42. The "Itai-itai" disease is caused due to :
- (A) lead exposure (B) iron exposure
(C) arsenic exposure (D) cadmium exposure

43. The symbiont *Anabaena* present in association with **Azolla** is a :
- (A) Green alga (B) Red alga
(C) Blue green alga (D) Brown alga
44. The species belonging to which genus is known as horsetail ?
- (A) **Selaginella** (B) **Equisetum**
(C) **Lycopodium** (D) **Sphagnum**
45. In Human, the potential difference across the membrane of nerve fibre when it does not show any physiological activity is about :
- (A) -60 mV (B) $+60\text{ mV}$
(C) -70 mV (D) $+90\text{ mV}$
46. In which of the following, polyp phase is not found ?
- (A) Aurelia (B) Hydra
(C) Obelia (D) Physalia
47. The chemosynthetic bacteria obtain energy from.:
- (A) UV rays (B) Sunlight
(C) Inorganic substances (D) Organic substances
48. The hypothalamic hormones reach the anterior pituitary gland through :
- (A) Hepatic portal circulation (B) Portal circulatory system
(C) Hypothalamic duct (D) Neurons
49. In human blood, the most abundant and the least abundant WBCs are :
- (A) Neutrophils and basophils respectively
(B) Lymphocytes and monocytes respectively
(C) Eosinophils and monocytes respectively
(D) Neutrophils and Eosinophils respectively

50. With regard to cockroach, which of the following statement is incorrect ?
- (A) The blood (haemolymph) is composed of colourless plasma and haemocytes.
 - (B) The hindgut is broader than midgut and differentiated into ileum, colon and rectum.
 - (C) Both gizzard and mandible helps in grinding the food particles.
 - (D) Heart of cockroach consists of elongated muscular tube lying along the mid ventral line of thorax and abdomen.
51. Malpighian tubules are :
- (A) Respiratory organs of insects
 - (B) Respiratory organs of annelids
 - (C) Excretory organs of insects
 - (D) Excretory organs of annelids
52. The external skeleton of molluscs is made up of :
- (A) Chitin
 - (B) Spongin fibres
 - (C) Calcium silicate
 - (D) Calcium carbonate
53. In the life history of **Plasmodium vivax**, Schuffner's dots are present on the surface of :
- (A) Sporozoite
 - (B) Infected erythrocytes
 - (C) Ookinete
 - (D) Infected hepatocyte
54. The virus isolated first was :
- (A) Tobacco mosaic virus
 - (B) Polio virus
 - (C) Bacteriophage
 - (D) Influenza virus
55. The hard protective outer covering for the brain in humans is called :
- (A) Skull and made up of 29 bones
 - (B) Skull and made up of 14 bones
 - (C) Cranium and made up of 8 bones
 - (D) Cranium and made up of 14 bones

56. The duct of gall bladder is called :
- (A) Hepatic duct (B) Common bile duct
(C) Hepato-pancreatic duct (D) Cystic duct
57. Which among the following statements is incorrect about the *Chi-square* distribution ?
- (A) The **Chi-square** curve is always positively skewed.
(B) The mean of distribution is the number of degrees of freedom.
(C) The **Chi-square** values decrease with the increase in degrees of freedom.
(D) For different degrees of freedom, the shape of the curve will be different.
58. The curve obtained by joining the middle points of the tops of the rectangles in a histogram by straight lines is known as :
- (A) Frequency curve (B) Frequency polygon
(C) Frequency density (D) Cumulative frequency
59. If the n is even, then the nos. of medians are the simple average of the middle :
- (A) 1 (B) 2
(C) 3 (D) 4
60. Compute the geometric mean of 1, 2, 4, 2 :
- (A) 1 (B) 2
(C) 2.25 (D) 3
61. The variance of a data series is 16. What is the value of standard deviation of this series ?
- (A) 256 (B) 64
(C) 8 (D) 4

62. When there is no correlation between the two variables, then $r = ?$
- (A) 0 (B) 1
(C) 2 (D) -1
63. Who first used the term "Regression" in the study of heredity ?
- (A) Francis Galton (B) Karl Pearson
(C) Kelly (D) A.L. Bowley
64. What is the probability of getting an even number in a single throw with a dice ?
- (A) 1 (B) $\frac{1}{2}$
(C) $\frac{1}{3}$ (D) $\frac{2}{3}$
65. Which among the following element is present in chlorophyll molecule ?
- (A) Fe (B) Mn
(C) Mg (D) Mo
66. Which among the following roots are negatively geotropic?
- (A) Prop roots (B) Stilt roots
(C) Botrytis roots (D) Pneumatophores
67. The study of the "foolish seedlings" or *bakanae* disease of rice plants lead to the discovery of which plant hormone ?
- (A) Auxins (B) Cytokinins
(C) Gibberellins (D) Ethylene
68. Which among the following is an example of nuclear disaster ?
- (A) Minamata case (B) Chernobyl disaster
(C) Exxon Valdez disaster (D) Bhopal gas tragedy
69. The reaction centre of PS I is :
- (A) P_{700} (B) P_{645}
(C) P_{663} (D) P_{680}

70. Which day is celebrated as Earth Day ?
(A) June 5 (B) December 1
(C) February 2 (D) April 22
71. Orchid sanctuary at Sessa is located in which state ?
(A) Assam (B) Arunachal Pradesh
(C) Sikkim (D) Meghalaya
72. Select the secondary air pollutant among the followings :
(A) CO_2 (B) SO_2
(C) NO (D) PAN
73. The device that removes dust particles from a flowing air is :
(A) ESP (B) HPLC
(C) AAS (D) PCR
74. The acid rain is mainly caused due to the higher concentrations of which gases in the atmosphere?
(A) CO and O_3 (B) CO_2 and CH_4
(C) SO_2 and NO_x (D) NH_4 and Ar
75. Within habitat diversity is referred to :
(A) alpha-diversity (B) beta-diversity
(C) gamma-diversity (D) delta-diversity
76. Which among the following acts as herbicide at high concentrations and plant hormone at low concentrations ?
(A) DCMU (B) Methyl viologen
(C) 2,4-D (D) Penicillin
77. Which among the following is an example of **ex situ** conservation approach ?
(A) Arborata (B) National Park
(C) Biosphere Reserve (D) Sacred Groves

78. The transition zone between two different ecosystems is known as :
- (A) Biome (B) Ecotone
(C) Ecological niche (D) Trophic level
79. The relationships between two different species in which one is benefitted and the other one harmed is known as :
- (A) Amensalism (B) Parasitism
(C) Symbiosis (D) Commensalism
80. With regard to productivity, which statement among the following is correct ?
- (A) Gross primary productivity is the rate of storage of organic matter in plant tissues in excess of the respiratory utilization.
- (B) Net primary productivity is the total rate of photosynthesis, including the organic matter used up in respiration.
- (C) Net community productivity is the rate of storage of organic matter not used by heterotrophs.
- (D) Secondary productivity should be divided into "gross" and "net" amounts.
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SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

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Environmental Science

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