Test Booklet Series

A

Test Booklet

ENVIRONMENT SCIENCE

Test Booklet No.

Name of Applicant ..... Answer Sheet No. .....

Applicant Roll No. : ..... Signature of Applicant : .....

Date of Examination: .....

Time of Examination : .....

Signature of the Invigilator(s)

1. .....

2. .....

Duration : 1½ Hours] **[Maximum Marks : 70**

IMPORTANT INSTRUCTIONS

(i) The question paper is in the form of Test-Booklet containing **70 (Seventy)** questions in three parts. Part–A and Part–C are common for all applicants while Part-B (Q.Nos. 21 to 45) is in two sets, mentioned saperately for the applicants with Biological background and for applicants with Non-Biological background. The applicants are advised to attempt only one respective Set of Part-B. All questions are compulsory. Each question carries four answers marked (A), (B), (C) and (D), out of which only one is correct. Choose the correct option or the most appropriate option.

(ii) On receipt of the Test-Booklet (Question Paper), the candidate should immediately check it and ensure that it contains all the pages, i.e., **70** questions. Discrepancy, if any, should be reported by the candidate to the invigilator immediately after receiving the Test-Booklet.

(iii) A separate Answer-Sheet is provided with the Test-Booklet/Question Paper. On this sheet there are **70** rows containing four circles each. One row pertains to one question.

(iv) The candidate should write his/her Roll number at the places provided on the cover page of the Test-Booklet/Question Paper and on the Answer-Sheet and NOWHERE ELSE.

(v) No second Test-Booklet/Question Paper and Answer-Sheet will be given to a candidate. The candidates are advised to be careful in handling it and writing the answer on the Answer-Sheet.

(vi) For every correct answer of the question **One (1) mark will be awarded.**

(vii) Marking shall be done only on the basis of answers responded on the Answer-Sheet.

(viii) To mark the answer on the Answer-Sheet, candidate should **darken** the appropriate circle in the row of each question with Blue or Black pen.

(ix) For each question only **one** circle should be **darkened** as a mark of the answer adopted by the candidate. If more than one circle for the question are found darkened or with one black circle any other circle carries any mark, the answer will be treated as incorrect.

(x) The candidates should not remove any paper from the Test-Booklet/Question Paper. Attempting to remove any paper shall be liable to be punished for use of unfair means.

(xi) Rough work may be done on the blank space provided in the Test-Booklet/Question Paper only.

(xii) *Mobile phones (even in Switch-off mode) and such other communication/programmable devices are not allowed inside the examination hall.*

(xiii) No candidate shall be permitted to leave the examination hall before the expiry of the time.

DO NOT OPEN THIS QUESTION BOOKLET UNTIL ASKED TO DO SO.

PART–A

(Compulsory for all)

1. The synonym of the word 'Dole' is .....

   (A) Amass (B) Dispute

   (C) Allocate (D) Forfeit.

2. In the following question, out of the given four alternatives, select the one which is **opposite in meaning** of the given word.

   Protract

   (A) Delay (B) Advance

   (C) Unwise (D) Sharp.

3. The question below consists of a set of labelled sentences. These sentences, when properly sequenced form a coherent paragraph. Select the most logical order of sentences from among the options.

   P : E-waste is valuable as a source of secondary raw material.

   Q : But it is also toxic if disposed of improperly.

   R : When we talk about recycling household and work place things, we tend to ignore or are less aware of how to deal with the electrical and electronic waste (sometimes called e-waste).

   S : Due to rapid technology change, obsolescent items have created a fast growing mass of electronic waste around the globe.

   (A) RQPS (B) QSPR

   (C) PQSR (D) RPQS.

4. Improve the bracketed part of the sentence.

   She emanated ebullience as she (learn) about her first rank in the exam.

   (A) learnt (B) learning

   (C) had learn (D) No improvement.

Directions (Q. 5-7) : Each of the following sentences has blank space and four words are given after the sentence. Select whichever word you consider most appropriate for the blank space.

5. The completion of the railway line has been held _____ owing to the workers' strike.

   (A) off (B) up

   (C) on (D) over.

6. His _____ directions misled us, we did not know which road to take.

(A) complex (B) obscure

(C) mingled (D) vague.

7. Let us _____ our heads together to solve this difficult problem.

(A) join (B) bring

(C) combine (D) put.

8. Choose the most appropriate option to fill in the blank.

The paths of glory lead ..... to the grave.

(A) straight (B) but

(C) in (D) directly

9. Kiran is standing at the centre of a circular field. Her daughter is sitting to the East of her on the boundary of the field. Kiran goes towards her daughter and gives her some chocolates, then she turns to left and walks along the boundary of the field equal to 3/4 of the length of the circular field where her son is waiting for chocolates. In which direction her son is sitting with respect to the location of her daughter?

(A) North-East (B) North-West

(C) South-West (D) West

10. Find ? in the series :

1, 2, 6, 7, 21, 22, 66, 67, ?

(A) 70 (B) 134

(C) 201 (D) 301

11. Find the wrong number in the series :

4, 32, 112, 256, 500

(A) 32 (B) 112

(C) 256 (D) 500

12. Following are the relationship codes.

1. 'A × B' means 'A is the father of B'.
2. 'A ÷ B' means 'A is the son of B'.
3. 'A * B' means 'A is the sister of B'.
4. 'A = B' means 'A is the daughter of B'
5. 'A – B' means 'A is the mother of B'.
6. 'A + B' means 'A is the brother of B'.

Using above codes choose the correct relationship in case of P × Q – R + S,

(A) P is the maternal uncle of R
(B) P is the grandfather of S
(C) Q is the nephew of P
(D) P is the grandmother of S

13. Study the following information carefully and answer the question given below:

1. 'cha cap ta pan' means 'he is playing golf'.
2. 'ta jap chi cap' means 'playing tennis is good'.
3. 'can cap pin go' means 'they are playing hockey'.
4. 'ver zo jap rot pin dar' means 'tennis and carrom are indoor games'.

Which of the following represents 'playing tennis' in that language?

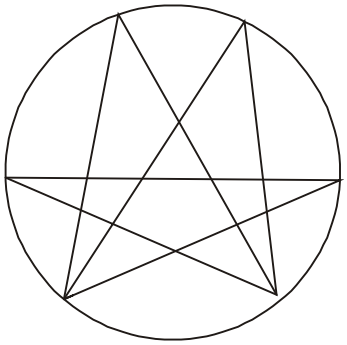
(A) ver chi
(B) pin ta
(C) jap cap
(D) ta jap

14. The average of a batsman in _____ innings is 44. If his average in the first _____ innings was 42, his average in the remaining innings is 45. Which of the following values can we fill in the same order?

a. 12, 6
b. 10, 4
c. 15, 5
d. 9, 3

(A) a only
(B) b and c only
(C) c and d only
(D) d only.

15. Find the number of triangles in the given figure :



(A) 22 (B) 24

(C) 26 (D) 28

16. Which is in ascending order?

(A) 1/3, 2/5, 3/5, 6/7 (B) 2/5, 1/3, 3/5, 6/7

(C) 1/3, 2/5, 6/7, 3/5 (D) 3/5, 6/7, 1/3, 2/5

17. Which of the following ruler built the Gujri Mahal in Hissar district?

(A) Muhammad Bin Tughlaq (B) Qutubuddin Ebak

(C) Feroz Shah Tughlaq (D) Qutubuddin Mubarak Shah

18. Western dedicated freight corridor (WDFC) passes through following districts of Haryana .....

(A) Faridabad-Karnal (B) Kundli -Palwal- Manesar

(C) Faridabad-Rewari-Narnaul (D) Hisar-Jind-Yamuna Nagar

19. Haryana covers following percentage of India's geographical area:

(A) 0.46 (B) 1.34

(C) 1.76 (D) 2.56

20. Which of the following is NOT a feature of the Indian Constitution?

(A) Fundamental Rights (B) Bill of Rights

(C) Directive Principles of State Policy (D) Preamble

PART–B (SET-1)

(Only for Biological Background)

21. Which of the following is a characteristic of angiosperms?

(A) Naked seeds

(B) Seed development in a fruit

(C) Water required for fertilization

(D) Lack of true roots, stems, and leaves

22. Which kingdom is characterized by the presence of a cell wall composed of chitin?

(A) Monera (B) Protista

(C) Fungi (D) Plantae

23. What is the main function of the xylem in vascular plants?

(A) Translocation of sugars (B) Water and mineral transport

(C) Food storage (D) Gas exchange

24. Meiosis occurs in

(A) Conidia (B) Meiocyte

(C) Megaspore (D) Gemmule

25. Vascular bundles are not found in

(A) Gymnosperms (B) Pteridophytes

(C) Angiosperms (D) Bryophytes

26. Which plant hormone is primarily responsible for cell elongation?

(A) Abscisic acid (B) Cytokinin

(C) Auxin (D) Gibberellin

27. Which of the following is NOT a characteristic of animal cells?

(A) Presence of a cell membrane
(B) Presence of a cell wall
(C) Presence of a nucleus
(D) Presence of mitochondria

28. Which of the following is a key function of the cytoplasm?

(A) Storage of genetic material
(B) Maintenance of cell shape
(C) Protein synthesis
(D) Production of energy

29. What is the main purpose of the citric acid cycle (Krebs cycle)?

(A) Conversion of glucose to ATP
(B) Production of amino acids
(C) Production of NADH and FADH2
(D) Synthesis of nucleic acids

30. Which enzyme is crucial for nitrogen fixation?

(A) Nitrogenase
(B) Nitrite reductase
(C) Nitrate reductase
(D) Amine oxidase

31. In what process do bacteria convert nitrates (NO_3^-) into nitrogen gas (N_2)?

(A) Nitrogen fixation
(B) Nitrification
(C) Denitrification
(D) Ammonification

32. What is the role of the mineral molybdenum in nitrogen metabolism?

(A) It's a component of nitrogenase
(B) It's a component of nitrate reductase
(C) It's a component of nitrite reductase
(D) It's involved in the urea cycle

33. Which plant family is known for producing important fiber crops like cotton and jute?

(A) Solanaceae (B) Malvaceae

(C) Asteraceae (D) Fabaceae

34. Which plant disease is characterized by dark, sunken spots on the leaves?

(A) Leaf spot (B) Powdery mildew

(C) Root rot (D) Anthracnose

35. What is the name of the fungus that causes potato late blight?

(A) Rhizoctonia solani (B) Fusarium oxysporum

(C) Phytophthora infestans (D) Puccinia graminis

36. The bio ethanol undergoes rectification in order to eliminate

(A) Sugar (B) Impurities

(C) Enzymes (D) Yeast

37. The carbon dioxide content of bio methane is _____.

(A) 30-40 (B) 55-60

(C) 32-43 (D) 35-45

38. Which of the following is an example of a biopesticide?

(A) An artificial pesticide

(B) A bacterium that controls insects

(C) A synthetic herbicide

(D) A non-living substance used to control pests

39. Which of the following is a key principle of environmental biotechnology?

(A) Using synthetic chemicals for pollution control

(B) Harnessing biological processes to address environmental problems

(C) Ignoring the impact of human activity on the environment

(D) Relying solely on physical methods for waste treatment

40. Which of the following is drought tolerant vegetable crop?

(A) Tomato
(B) Brinjal
(C) Sweet Potato
(D) None of the above

41. Which enzyme is responsible for the breakdown of carbohydrates in the mouth?

(A) Pepsin
(B) Amylase
(C) Lipase
(D) Trypsin

42. Which of these statements is true about internal respiration?

(A) Production of ATP
(B) Exchange of gases between the bloodstream and tissue cells
(C) Exchange of gases between alveoli and the bloodstream
(D) Breathing between the atmosphere and the alveoli

43. Which of the following blood vessels carries oxygenated blood from the heart to the body?

(A) Veins
(B) Arteries
(C) Capillaries
(D) Lymphatic vessels

44. What type of muscle tissue is responsible for voluntary movement?

(A) Smooth muscle
(B) Cardiac muscle
(C) Skeletal muscle
(D) All of the above

45. Which part of the nervous system is responsible for reflexes?

(A) Brain
(B) Spinal cord
(C) Peripheral nervous system
(D) Central nervous system

PART–B (SET-2)

(Only for Non-Biological Background)

21. Which force is responsible for holding the nucleus of an atom together?

(A) Gravitational force
(B) Electromagnetic force
(C) Weak nuclear force
(D) Strong nuclear force

22. Which force is the weakest of the four fundamental forces?

(A) Gravitational force
(B) Electromagnetic force
(C) Weak nuclear force
(D) Strong nuclear force

23. What is the fundamental nature of the relationships described by physical laws?

(A) Random and unpredictable
(B) Deterministic and precise
(C) Qualitative and descriptive
(D) Probabilistic and uncertain

24. If an object moves in a circular path with constant speed, what type of acceleration does it experience?

(A) Linear acceleration
(B) Tangential acceleration
(C) Centripetal acceleration
(D) Gravitational acceleration

25. What is the SI unit of energy?

(A) Newton
(B) Joule
(C) Watt
(D) Pascal

26. Which of the following processes is irreversible?

(A) A reversible heat engine cycle
(B) An isothermal expansion
(C) A spontaneous chemical reaction
(D) A perfect crystal at 0 K

27. What is the efficiency of a Carnot engine operating between temperatures T1 and T2 (where T1 > T2)?

(A) (T1 – T2)/T1
(B) (T2 – T1)/T1
(C) (T1 – T2)/T2
(D) T2/T1

28. Which law states that the total energy of an isolated system remains constant?

(A) First Law of Thermodynamics
(B) Second Law of Thermodynamics
(C) Third Law of Thermodynamics
(D) Zeroth Law of Thermodynamics

29. What is the relationship between the specific heat capacities at constant pressure (Cp) and constant volume (Cv) for an ideal gas?

(A) $Cp = Cv$
(B) $Cp > Cv$
(C) $Cp < Cv$
(D) $Cp - Cv = R$

30. Which of the following is a characteristic of a longitudinal wave?

(A) Transverse oscillation of the medium particles
(B) Oscillation perpendicular to the direction of wave propagation
(C) Compressions and rarefactions in the medium
(D) Oscillations in only one direction

31. What is the range of frequencies that humans can typically hear?

(A) 0 Hz to 10 kHz
(B) 10 Hz to 20 kHz
(C) 20 Hz to 20 kHz
(D) 10 Hz to 100 kHz

32. Which law states that the total energy radiated by a black body is proportional to the fourth power of its temperature?

(A) Wien's Displacement Law
(B) Stefan-Boltzmann Law
(C) Rayleigh-Jeans Law
(D) Planck's Law

33. Wien's Displacement Law describes the relationship between:

(A) Energy and temperature
(B) Temperature and wavelength of peak emission
(C) Energy and wavelength of peak emission
(D) Energy and time

34. If n(A) = 5 and n(B) = 7, what is the minimum possible value of n(A $\cup$ B)?

(A) 5 (B) 7

(C) 12 (D) 10

35. The value of $\cos(2\pi/3)$ is:

(A) 1/2 (B) $-1/2$

(C) $\sqrt{3}/2$ (D) $-\sqrt{3}/2$

36. The period of the function $y = \cos(2x)$ is :

(A) π (B) 2π

(C) $\pi/2$ (D) $\pi/3$

37. What is the coefficient of x^3 in the expansion of $(1 + x)^5$?

(A) 10 (B) 5

(C) 1 (D) 3

38. The series $1 + 2 + 3 + ... + n$ is equal to:

(A) $n(n+1)/2$ (B) $n(n-1)/2$

(C) $n(n+2)/2$ (D) $n(n-2)/2$

39. The common ratio of the geometric progression 2, 4, 8, 16, ... is:

(A) 2 (B) 3

(C) 4 (D) 1

40. The sum of the infinite geometric progression 1 + 1/2+ 1/4 + ... is:

(A) 1 (B) 2

(C) 3 (D) 1/2

41. What is the integral of sin (x) dx?

(A) cos (x) + C (B – cos (x) + C

(C) sin (x) + C (D) – sin (x) + C

42. What is the definite integral of cos(x) from 0 to $\pi/2$?

(A) 1 (B) 0

(C) –1 (D) 2

43. Which of the following is a linear differential equation?

(A) y′ + xy = x^2, (B) y′y′′ = 0,

(C) (y′)^2 + y = x, (D) y′ + y^2 = x

44. Which of the following is a state function?

(A) Work (B) Heat

(C) Internal Energy (D) Temperature

45. The Gibbs free energy change (ΔG) for a spontaneous reaction is:

(A) Positive (B) Negative

(C) Zero (D) Can be positive or negative

PART–C

(Compulsory For all)

46. What is the phase transition where a solid directly changes to a gas?

(A) Melting
(B) Vaporization
(C) Sublimation
(D) Condensation

47. Which of the following is an example of a chemical change?

(A) Dissolving salt in water
(B) Melting ice
(C) Burning a piece of paper
(D) Evaporation of water

48. The number of protons in an atom's nucleus is known as the:

(A) Mass number
(B) Atomic number
(C) Neutron number
(D) Valence number

49. Which of the following represents the correct relationship between atomic mass unit (amu) and the mass of a carbon-12 atom?

(A) 1 amu = 1/12 the mass of a carbon-12 atom
(B) 1 amu = the mass of a carbon-12 atom
(C) 1 amu = 12 times the mass of a carbon-12 atom
(D) 1 amu = 1/2 the mass of a carbon-12 atom

50. What is the general behavior of metal oxides?

(A) Acidic
(B) Basic
(C) Neutral
(D) Amphoteric

51. Which of the following is an example of an amphoteric oxide?

(A) MgO
(B) Al_2O_3
(C) CaO
(D) SO_2

52. Which of the following statements is true regarding carbon?

(A) Carbon is a metallic element.

(B) Carbon has a high melting point and is a good conductor of electricity.

(C) Carbon exhibits catenation, the ability to form chains of itself.

(D) Carbon always forms ionic compounds.

53. Which functional group is present in an ester?

(a) –OH

(b) $-NH_2$

(c) –CO–

(d) –COO–

54. Which of the following is the most electronegative element?

(A) Chlorine

(B) Fluorine

(C) Oxygen

(D) Nitrogen

55. As you move down a group in the periodic table, the atomic size:

(A) Increases

(B) Decreases

(C) Remains constant

(D) Increases and then decreases

56. Calcium carbonate is the chemical formula of

(A) limestone

(B) chalk

(C) marble

(D) all (A), (B) and (C)

57. Which of the following are present in a dilute aqueous solution of hydrochloric acid?

(A) $H_3O^+ + Cl^-$

(B) $H_3O^+ + OH^-$

(C) $Cl^- + OH^-$

(D) unionised HCI

58. Which of the following is a disaccharide?

(A) Glucose

(B) Sucrose

(C) Fructose

(D) Ribose

59. What type of chemical is sodium benzoate, a food preservative?

(A) An antioxidant
(B) An emulsifier
(C) A sweetener
(D) A surfactant

60. Dishwashing liquids are examples of _____

(A) soaps
(B) anionic detergents
(C) cationic detergents
(D) non-ionic detergents

61. The Earth's solid crust and upper mantle make up the:

(A) Atmosphere
(B) Hydrosphere
(C) Lithosphere
(D) Biosphere

62. Which term refers to the global community of living organisms and their physical environment?

(A) Ecosystem
(B) Biome
(C) Biosphere
(D) Community

63. In what biome would you expect to find polar bears and arctic foxes?

(A) Savanna
(B) Taiga
(C) Tundra
(D) Desert

64. What is the primary cause of global warming?

(A) Increased solar radiation
(B) Decreased atmospheric pressure
(C) Increased levels of greenhouse gases
(D) Decreased ozone layer

65. Which of the following is NOT a way to conserve natural resources?

(A) Reduce, reuse, and recycle
(B) Using more fossil fuels
(C) Promoting sustainable agriculture
(D) Conserving water

66. Which Indian state is the largest Bauxite producing state?

(A) Odisha
(B) Bihar
(C) Madhya Pradesh
(D) Jharkhand

67. What is the Montreal Protocol?

(A) An international treaty to reduce greenhouse gas emissions.
(B) An agreement to protect biodiversity in marine ecosystems.
(C) A treaty to phase out the production and use of ozone-depleting substances.
(D) A protocol for space exploration.

68. What is the main cause of acid rain?

(A) Sulfur dioxide and nitrogen oxides
(B) Ozone
(C) Carbon dioxide
(D) Particulate matter

69. Which of the following is a primary air pollutant?

(A) Ozone
(B) Peroxyacetyl nitrate (PAN)
(C) Carbon monoxide
(D) Both (A) and (B)

70. The Wildlife (Protection) Act was enacted in the year

(A) 1974
(B) 1972
(C) 1994
(D) 1986

ROUGH WORK

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