SECTION : PHYSICS

This section contains **9 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

1. A rectangular field is 25 m long and 18 m wide. A student walks around the field twice. What total distance does the student cover?
(1) 450 m
(2) 86 m
(3) 172 m
(4) 900 m

2. A ribbon is 2.5 m long. It is cut into pieces of 25 cm each. How many complete pieces can be obtained?
(1) 5
(2) 10
(3) 25
(4) 100

3. A bar magnet is broken into two equal pieces. Which statement is correct?
(1) One piece has only a north pole and the other only a south pole.
(2) Both pieces become non-magnetic.
(3) Each piece has its own north and south poles.
(4) Only one piece retains magnetism.

4. Three identical iron nails are placed near a strong magnet. Nail A touches the magnet, nail B hangs from A, and nail C hangs from B. Which statement best explains this arrangement?
(1) All three nails were permanently magnetised before contact.
(2) The nails can acquire temporary magnetism by induction.
(3) Only nail C becomes magnetic.
(4) Gravity is responsible for the magnetic attraction.

5. Planet A takes 88 Earth days to revolve around the Sun, while Planet B takes about 365 Earth days. Which conclusion is correct?
(1) Planet A is farther from the Sun than Planet B.
(2) Planet A is Mercury, and Planet B is Earth.
(3) Planet A rotates only once every 88 Earth days.
(4) Planet B has no natural satellite.

6. Which combination is necessary to make a simple electric bulb glow?
(1) A bulb, a cell and an open circuit
(2) A bulb, a cell and a complete conducting path
(3) A bulb and two disconnected wires
(4) A magnet and an iron nail only

7. A car travels 60 km in the first hour and 40 km in the second hour. What is its average speed over the entire journey?
(1) 40 km/h
(2) 50 km/h
(3) 60 km/h
(4) 100 km/h

8. Two bar magnets are suspended freely. When brought close together, they repel each other. Which statement must be true?
(1) Both magnets have equal strength.
(2) Their like poles are facing each other.
(3) Their unlike poles are facing each other.

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(4) Both magnets have lost their magnetism.

9. Which material is the best choice for the conducting core of an ordinary electrical connecting wire?

(1) Rubber
(2) Dry wood
(3) Copper
(4) Glass

SECTION : CHEMISTRY

This section contains **9 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

10. Which of the following are greenhouse gases?
(i) Carbon dioxide (ii) Methane (iii) Nitrogen (iv) Water vapour

(1) (i) and (ii)
(2) (i), (ii) and (iv)
(3) (ii), (iii) and (iv)
(4) (i), (iii) and (iv)

11. Acid rain is mainly caused by:

(1) Carbon monoxide and hydrogen
(2) Oxides of sulphur and nitrogen dissolved in rain water
(3) Excess ozone in the stratosphere
(4) Dust particles in the air

12. The ozone layer is important because it:

(1) Is present in the troposphere and traps heat
(2) Absorbs harmful ultraviolet rays of the Sun and is found in the stratosphere
(3) Produces oxygen for breathing
(4) Reflects infrared rays back into space

13. During the electrolysis of water, 20 mL of oxygen is collected at one electrode. The volume of hydrogen collected at the other electrode is:

(1) 10 mL
(2) 20 mL
(3) 40 mL
(4) 60 mL

14. Bubbles appear in a beaker of tap water even before it begins to boil. This is because:

(1) Water breaks down into hydrogen and oxygen
(2) The solubility of dissolved gases in water decreases on heating
(3) Water changes into steam at 40°C
(4) The beaker releases air on heating

15. Which of the following is the best way to remove temporary hardness of water?

(1) Filtration
(2) Boiling
(3) Decantation
(4) Adding common salt

16. Green copper carbonate is heated strongly in a test tube. It turns black, and the gas evolved turns lime water milky. This is:

(1) A physical change, because colour changes
(2) A chemical change, because new substances (copper oxide and carbon dioxide) form
(3) A physical change, because heat is supplied
(4) A chemical change, because the mass remains the same

17. Perfume sprayed in one corner of a room is smelt across the room sooner on a hot day than on a cold day. This is because:

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(1) Particles of matter attract each other more at higher temperature
(2) Particles move faster at higher temperature, so diffusion is faster
(3) Particles become smaller on heating
(4) Air becomes lighter on cooling

18. A liquid turns red litmus blue and has a pH value close to:

(1) 2
(2) 5
(3) 7
(4) 10

SECTION : MATHEMATICS

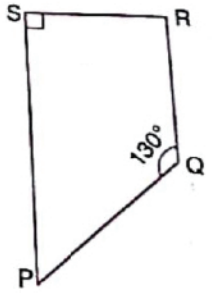
This section contains **9 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

19. Find :
$\frac{-7}{4}+\frac{5}{3}+\frac{-5}{6}+\frac{1}{3}+\frac{-1}{2}$

(a)13/12
(b)-13/12
(c) 13/14
(d)11/4

20. Solve $x-\frac{2x+8}{3}=\frac{1}{4}(x-\frac{2-x}{6})-3$.
(a) x=-10
(b) x=10
(c) x=20
(d) x=30

21. The adjacent figure, PQRS is a trapezium in which SP|| RQ , find the measures of ∠P and ∠R .



(a) ∠P = 50° and ∠R = 70°
(b) ∠P = 90° and ∠R = 90°
(c) ∠P = 50° and ∠R = 90°
(d) ∠P = 60° and ∠R = 90°

22. Find the square root of 237.615 correct to three places of decimal.

(a) 15.415
(b) 15.417
(c) 15.315
(d) 15.515

23. Ram Singh buys a refrigerator for ₹ 4000 on credit. The rate of interest for the first year is 5% and of the second year is 15%. How much will it cost him if he pays the amount after two years?

(a) ₹4850
(b) ₹4800
(c) ₹3830
(d) ₹4830

24. If $4x^2 + y^2 = 40$ and xy = 6 , find the value of 2x + y.

(a) $\pm$ 8
(b) $\pm$6
(c) 4
(d) $\pm$ 9

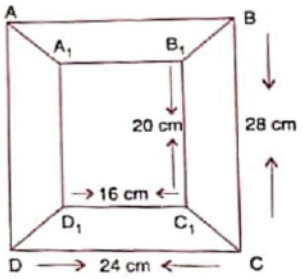
25. Factorize:
$4y^2 - 8y + 3$

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(a) (2y – 4)(2y - 1)
(b) (2y – 4)(2y - 2)
(c) (2y – 3)(2y - 1)
(d) (2y – 5)(2y - 1)

26. The picture frame shown in the Figure has outer dimensions 24 cm X 28 cm and inner dimensions 16 cm X 20 cm. Find the area of each section of the frame, if the width of each section is same.



(a) The areas of the top and bottom sections are $80cm^2$ each.
The areas of the left and right sections are $90cm^2$ each.

(b) The areas of the top and bottom sections are $86cm^2$ each.
The areas of the left and right sections are $96cm^2$ each.

(c) The areas of the top and bottom sections are $80cm^2$ each.
The areas of the left and right sections are $89cm^2$ each.

(d) The areas of the top and bottom sections are $80cm^2$ each.
The areas of the left and right sections are $96cm^2$ each.

27. A company packages its milk powder in cylindrical containers whose base has a diameter of 16.8 cm and height 20.5 cm. Company places a label around the curved surface of the container. If the label is placed 1.5 cm from the top and the bottom, what is the surface area of the label?
(a) 900 cm^2
(b) 800 cm^2
(c) 924 cm^2
(d) 860 cm^2

SECTION : BIOLOGY

This section contains **9 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

28. A pitcher plant uses its leaves to trap insects, the plant can still prepare its own food. What is the main benefit of trapping insects?

(1) Insects provide the chlorophyll required for photosynthesis.
(2) Insects provide supplementary nitrogen needed for growth.
(3) Insects supply all the energy required by the plant.
(4) Insects help the plant absorb sunlight through its roots.

29. A village experiences an increase in mosquito-borne diseases during the rainy season. Which measure would most directly reduce mosquito breeding?

(1) Removing stagnant water from drains and discarded tyres.
(2) Keeping doors and windows shut throughout the night
(3) Release dragonflies in the area.
(4) Both 1 and 3

30. A child has bleeding gums and poor wound healing. A deficiency of which vitamin is most likely responsible?

(1) Vitamin A
(2) Vitamin C

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(3) Vitamin D
(4) Vitamin K

31. A flask containing moist germinating seeds shows a slight rise in temperature, while a similar flask containing boiled seeds does not. What does this observation demonstrate?

(1) Germination takes place only when seeds absorb heat from the surroundings.
(2) Germinating seeds absorb heat to perform photosynthesis in darkness.
(3) Boiled seeds produce more energy because their respiration is faster.
(4) Germinating seeds release heat during respiration.

32. Warm sugar solution is mixed with yeast and kept covered completely. Gas bubbles appear after some time. Which process most likely accounts for this observation?

(1) Photosynthesis producing oxygen
(2) Transpiration releasing water vapour
(3) Anaerobic respiration producing carbon dioxide and alcohol
(4) Aerobic respiration producing oxygen as its main gas product

33. A white flower is placed in water containing a red dye. After several hours, coloured lines appear in the stem and the petals begin to turn red. Which tissue is mainly responsible for transporting the coloured water?

(1) Phloem
(2) Xylem
(3) Epidermis
(4) Meristem

34. A plant is placed in a highly concentrated salt solution. After some time, its cells lose water and the plant begins to wilt. Why?

(1) Photosynthesis
(2) Translocation
(3) Active transport of sugars
(4) Exosmosis

35. During adolescence, a student develops oily skin and pimples. Which change most directly contributes to this condition?

(1) Complete stoppage of sweat gland activity
(2) Increased activity of sebaceous glands.
(3) Disappearance of bacteria from the skin
(4) Reduced activity of skin glands

36. Two healthy students of the same age begin showing signs of puberty at different times. Which conclusion is scientifically correct?

(1) The student who matures later must have a hormonal disorder.
(2) Puberty always begins at exactly the same age in all individuals.
(3) The timing of puberty varies among individuals and is not necessarily a sign of ill health.
(4) Puberty begins only when a person reaches a particular height.

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SECTION : IQ

This section contains **9 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

37. If A means +, B means −, C means × and D means ÷, find the value of:
24 D 6 C 3 A 8 B 4
(1) 12
(2) 16
(3) 20
(4) 24

38. Which letter is fifth to the right of the letter that is twelfth from the left in the English alphabet?
(1) P
(2) Q
(3) R
(4) S

39. If TABLE is coded as GZYOV using the reverse-alphabet rule (A ↔ Z, B ↔ Y, C ↔ X, and so on), how will CHAIR be coded?
(1) XSZRI
(2) XSAIR
(3) XSZIR
(4) XH ZRI

40. In a code language, SCHOOL is written as LOOHCS and MARKET is written as TEKRAM. How will TEACHER be written?
(1) REHCAET
(2) REHCEAT
(3) RAEH CET
(4) REHCAETT

41. Find the missing letter:
B, E, J, Q, ?
(1) X
(2) Y
(3) Z
(4) A

42. Book is related to Author in the same way as Painting is related to:
(1) Sculptor
(2) Artist
(3) Gallery
(4) Colour

43. Six people A, B, C, D, E and F sit in a circle facing the centre. A sits opposite D. B sits immediately clockwise from A. C sits immediately clockwise from B. Who sits opposite B?
(1) C
(2) D
(3) E
(4) F

44. Seven students are standing in a row facing north. M is fourth from the left. N is second to the right of M, while P is third to the left of N. What is P's position from the right?
(1) Third
(2) Fourth
(3) Fifth
(4) Sixth

45. Which relationship best represents Squares, Rectangles and Polygons?
(1) All squares are rectangles, all rectangles are polygons, and some polygons are not rectangles.
(2) All polygons are squares.
(3) All rectangles are squares.
(4) Squares and rectangles have no relationship.

46. In a class, 40 students play Cricket, 28 play Football, and 12 play both. How many students play at least one of the two games?

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(1) 56
(2) 60
(3) 68
(4) 80

47. In a class of 45 students, Riya ranks 12th from the top. What is her rank from the bottom?
(1) 32nd
(2) 33rd
(3) 34th
(4) 35th

48. A woman says about a boy, "His mother is the only daughter of my mother." How is the woman related to the boy?
(1) Sister
(2) Mother
(3) Maternal grandmother
(4) Aunt

49. Introducing a man, Priya says, "His wife is the only daughter of my father." How is the man related to Priya?
(1) Brother
(2) Husband
(3) Father
(4) Uncle

50. Study the sequence:
2 A 5 C 8 E 11 G 14 I 17 K
If all the numbers are removed, which letter will be fourth from the right?
(1) E
(2) G
(3) I
(4) K

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