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 sharp knife cuts vegetables more easily than a blunt knife because the sharp knife:
(1) applies a greater force in every situation
(2) exerts greater pressure due to its smaller contact area
(3) produces less friction with the vegetable
(4) reduces the weight of the vegetable

2. A student pushes a wall with a force of 50 N, but the wall does not move. Which statement is correct?
(1) No force acts on the wall.
(2) The student does no work on the wall in the physics sense of mechanical work.
(3) The wall experiences no reaction force.
(4) The force applied by the student disappears.

3. A suction cup sticks to a smooth wall mainly because:
(1) gravity pulls it towards the wall
(2) friction alone pushes it against the wall
(3) atmospheric pressure pushes it against the wall
(4) the wall attracts it magnetically

4. A sound wave completes 600 vibrations in 3 seconds. Its frequency is:
(1) 100 Hz
(2) 200 Hz
(3) 300 Hz
(4) 1800 Hz

5. A tuning fork produces a sound of frequency 256 Hz. If its frequency increases while its amplitude remains unchanged, the sound will become:
(1) louder, with unchanged pitch
(2) softer, with lower pitch
(3) higher in pitch, with approximately unchanged loudness
(4) louder and lower in pitch

6. A student stands 3 m in front of a plane mirror and walks 1 m towards it. By how much does the distance between the student and the image decrease?
(1) 1 m
(2) 2 m
(3) 3 m
(4) 4 m

7. A student stands 3 m in front of a plane mirror and walks 1 m towards it. By how much does the distance between the student and the image decrease?
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(3) 3 m

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(4) 4 m

8. Which event occurs when the Moon comes between the Sun and Earth and blocks the Sun's light for an observer in the appropriate region?
(1) Lunar eclipse
(2) Solar eclipse
(3) Full Moon
(4) Meteor shower

9. A car travels 120 km in 2 hours and then 60 km in 1 hour. Its average speed for the entire journey is:
(1) 50 km/h
(2) 60 km/h
(3) 75 km/h
(4) 90 km/h

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. Match the alloy with its constituents: (A) Brass (B) Bronze (C) Solder.

(1) A = Cu + Zn, B = Cu + Sn, C = Pb + Sn
(2) A = Cu + Sn, B = Cu + Zn, C = Pb + Sn
(3) A = Cu + Zn, B = Pb + Sn, C = Cu + Sn
(4) A = Fe + C, B = Cu + Sn, C = Pb + Zn

11. Water is NOT used to put out a petrol or oil fire because:

(1) Water reacts with oil to form explosive gases
(2) Oil is lighter than water, so it floats and spreads the fire
(3) Water increases the ignition temperature of oil
(4) Water cannot absorb heat

12. A goldsmith heats gold with a blowpipe in the outermost zone of the flame because this zone:

(1) Is the luminous zone with partial combustion
(2) Is the dark zone containing unburnt wax vapour
(3) Is the hottest zone because of complete combustion
(4) Contains the maximum amount of carbon particles

13. 250 g of a fuel on complete burning releases 11,250 kJ of heat. What is the calorific value of the fuel?

(1) 2,812 kJ/kg
(2) 11,250 kJ/kg
(3) 22,500 kJ/kg
(4) 45,000 kJ/kg

14. In Rutherford's gold foil experiment, a few alpha particles bounced back. This shows that:

(1) Electrons are present inside the nucleus
(2) The atom is a uniform sphere of positive charge
(3) A small, dense, positively charged nucleus is present at the centre of the atom
(4) Neutrons attract alpha particles

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15. An atom has atomic number 11 and mass number 23. The sodium ion Na^+ formed from it has:
(1) 11 electrons and 12 neutrons
(2) 10 electrons and 12 neutrons
(3) 10 electrons and 13 neutrons
(4) 12 electrons and 11 neutrons

16. The formula of the compound formed between aluminium (atomic number 13) and oxygen (atomic number 8) is:

(1) AlO
(2) Al_2O
(3) Al_2O_3
(4) Al_3O_2

17. Which of the following pairs are isobars?

(1) $_{18}Ar^{40}$ and $_{20}Ca^{40}$
(2) $_{17}Cl^{35}$ and $_{17}Cl^{37}$
(3) $_{6}C^{12}$ and $_{6}C^{14}$
(4) $_{19}K^{39}$ and $_{20}Ca^{40}$

18. An element has the electronic configuration 2, 8, 8, 2. Which statement is correct?

(1) It is a noble gas with valency 0
(2) It is a non-metal with valency 2
(3) It is a metal with valency 2
(4) It is a metal with valency 8

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 a rational number between $\sqrt{5}$ and $\sqrt{7}$

(1)2.5
(2)2
(3)5
(4)2.8

20. 6000 workers were employed to construct a river bridge in four years. At the end of first year, 20% workers were retrenched. At the end of second year, 5% of the workers at that time were retrenched. However, to complete the project in time, the number of workers was increased by 15% at the end of third year. How many workers were working during the fourth year?

(1)4500
(2)5244
(3)5000
(4)6500

21. Solve the following pairs of equations: $\frac{1}{3x+y}+\frac{1}{3x-y}=\frac{3}{4}, \frac{1}{2(3x+y)}-\frac{1}{2(3x-y)}=-\frac{1}{8}$

(1) x= 1,y=1
(2) x= 2,y=1
(3) x= 1,y=3
(4) x= -1,y=1

22. $\sqrt{\left(\frac{3}{5}\right)^{1-2x}}=4\frac{17}{27}$

(1)x=5/6
(2)x=1/7
(3)x=7/2

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(4)x=-7/2

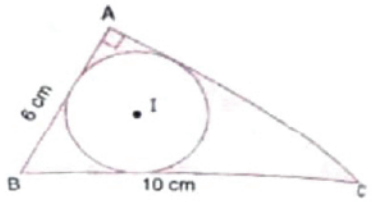
23. An aeroplane leaves an airport and flies due north at a speed of 1000 km per hour. At the same time, another aeroplane leaves the same airport and flies due west at a speed of 1200 km per hour. How far apart will be the two planes after $1\frac{1}{2}$ hours?

(1) $300\sqrt{61}$ km
(2) $340\sqrt{61}$ km
(3) $305\sqrt{61}$ km
(4)$300\sqrt{60}$ km

24. The base of an isosceles triangle measures 24 cm and is area is 60 cm^2. Find its perimeter (using Heron's formula).

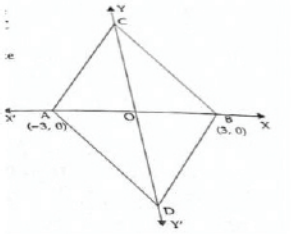
(1)23cm
(2)55cm
(3)50cm
(4)60cm

25. In the adjoining figure, ABC is a right-angled triangle at A. Find the area of the shaded region if AB = 6 cm, BC = 10 cm and I is the centre of incircle of ABC. Take $\pi = \frac{22}{7}$



(1)$11\frac{1}{7}\ cm^2$
(2) $10\frac{3}{7}\ cm^2$
(3) $11\frac{8}{9}\ cm^2$
(4) $11\frac{3}{7}\ cm^2$

26. In the adjoining figure, Δ ABC and Δ ABD are equilateral triangles. Find the coordinateof the points C and D.



(1)The coordinates of the point C are $(0,\sqrt[3]{3})$, The coordinates of the point D are$(0,-\sqrt[3]{3})$
(2) The coordinates of the point C are $(2,\sqrt[3]{3})$, The coordinates of the point D are$(0,-\sqrt[3]{3})$
(3) The coordinates of the point C are $(0,\sqrt[3]{3})$, The coordinates of the point D are$(-1,-\sqrt[3]{3})$
(4) The coordinates of the point C are $(1,\sqrt[3]{3})$, The coordinates of the point D are$(0,-\sqrt[3]{3})$

27. In what period of time will ₹12000 yield ₹3972 as compound interest at 10% per annum , if compounded on yearly basis.

(1)2 years
(2)1 year
(3)3 years
(4)5 years

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 patient is prescribed antibiotics for a viral infection.

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Why is this treatment both ineffective and potentially harmful?

(1) Viruses have thicker cell walls than bacteria, preventing antibiotic penetration.
(2) Antibiotics target specific bacterial metabolic pathways and structures (like cell walls) that viruses lack; misuse promotes antibiotic resistance in harmless body bacteria.
(3) Antibiotics neutralize the host's antibodies, leaving them vulnerable to the virus.
(4) The virus will absorb the antibiotic and mutate into a superbug.

29. Which of the following is a non-communicable disease caused by a combination of genetic predisposition and lifestyle factors, characterized by cellular insulin resistance?

(1) Type 1 Diabetes
(2) Tuberculosis
(3) Type 2 Diabetes
(4) Cholera

30. If the epiglottis fails to function correctly during swallowing, what is the immediate physiological risk?

(1) Acid reflux into the esophagus.
(2) Food entering the trachea, causing choking and potential aspiration pneumonia.
(3) Rapid movement of food into the duodenum before stomach digestion is complete.
(4) Blockage of the nasal cavity.

31. Humans cannot digest cellulose because we lack the enzyme cellulase. However, roughage (dietary fiber) is still essential. Why?

(1) It is converted into essential amino acids by gut bacteria.
(2) It absorbs toxins and adds bulk to the stool, stimulating peristalsis and preventing constipation.
(3) It is broken down into glucose by stomach acid.
(4) It lines the stomach to protect against ulcers.

32. In In Vitro Fertilization (IVF), where does the actual fusion of the male and female gametes occur?

(1) Inside the fallopian tube
(2) Inside the uterus
(3) In a laboratory dish outside the body
(4) Inside the ovary

33. In human males, the deepening of the voice during adolescence is directly caused by:

(1) The enlargement of the larynx (Adam's apple) under the influence of testosterone.
(2) The lengthening of the trachea due to growth hormone.
(3) The thickening of the vocal cords caused by thyroxine.
(4) Increased lung capacity pressing against the throat.

34. During the nitrogen cycle, which process is strictly anaerobic and results in the loss of usable nitrogen from the soil back into the atmosphere?

(1) Nitrogen fixation
(2) Nitrification

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(3) Ammonification
(4) Denitrification

35. In a parasitic food chain where a single large tree supports hundreds of herbivorous birds, which in turn host thousands of parasites, what is the shape of the pyramid of numbers?

(1) Upright
(2) Inverted
(3) Spindle-shaped
(4) Linear

36. Biomagnification is most highly concentrated in which trophic level of an ecosystem?

(1) Primary producers
(2) Primary consumers
(3) Secondary consumers
(4) Apex predators

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

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(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?
(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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