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Roll No. :

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Total : 100 Questions

Time : 2 Hours

CLASS

9

ENGLISH MEDIUM

- ◆ The paper consists of Four sections

MATHS : Section A : (20 Questions), Section B : (5 Questions)

CHEMISTRY : Section A : (20 Questions), Section B : (5 Questions)

BIOLOGY : Section A : (20 Questions), Section B : (5 Questions)

PHYSICS : Section A : (20 Questions), Section B : (5 Questions)

- ◆ Each question carries 1 mark. For each correct response, the candidate will get 1 marks. For each incorrect response, 0.25 marks will be deducted from the total scores.
- ◆ All questions are compulsory.
- ◆ Use of calculator is not permitted. Write your Name, Roll No. and Class clearly on the OMR SHEET and do not forget to sign it.
- ◆ To mark your choice of answers by darkening the circles in the OMR SHEET, use an HB Pencil or a Blue / Black ball point pen only.
E.g. 11. (A) (B) (C) (D)
- ◆ Rough work should be done in the blank space provided in the booklet.
- ◆ Return the OMR SHEET to the invigilator at the end of the exam.
- ◆ Write your Roll No. on the Question Paper too and take it home for future reference.

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MATHS – SECTION – A

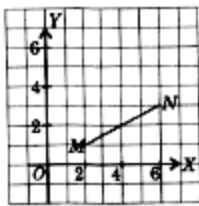
1. $(x - y)(x + y)(x^2 + y^2)(x^2 + xy + y^2)(x^2 - xy + y^2)(x^4 - x^2y^2 + y^4)$ is equal to

(a) $x^8 - y^8$ (b) $x^{10} - y^{10}$
(c) $x^{12} - y^{12}$ (d) $x^9 - y^9$

2. If $a = \sqrt{6 - \sqrt{11}}$ and $b = \sqrt{6 + \sqrt{11}}$, then the value of $(a + b)$ is

(a) $\sqrt{22}$ (b) $2\sqrt{11}$
(c) $\sqrt{6}$ (d) $\sqrt{12}$

3. The diagram shows two points, M and N on a cartesian plane. The ordinate of M and abscissa of N respectively are



(a) 3, 2 (b) 3, 1
(c) 1, 6 (d) 3, 6

4. In the equation $ax + by + c = 0$, if $a = b = c \neq 0$, then

(a) $x + y + c = 0$
(b) $x + y + 1 = 0$
(c) $x - y - 1 = 0$
(d) $x + y - c = 0$

5. Given that $2A + 7 = 11$. The following steps of working have been used to find the value of A.

Step – I: $2A + 7 = 11$ (Given)

Step – II: $7 = 7$

Step – III: $(2A + 7) - 7 = 11 - 7$

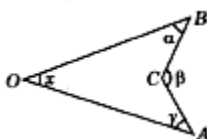
Step – IV: $2A = 4 \Rightarrow 2(A) = 2(2)$

Step – V: $A = 2$

Which Euclid's axiom has been used at Step V?

(a) 1 (b) 3
(c) 6 (d) 7

6. In the given figure, the value of x is



(a) $\alpha + \beta - \gamma$ (b) $\alpha - \beta + \gamma$
(c) $\beta - \alpha - \gamma$ (d) $\alpha - \gamma - \beta$

7. A, B, C are the three angles of a triangle. If $A - B = 15^\circ$, $B - C = 30^\circ$ then $\angle A$, $\angle B$, $\angle C$ are respectively.

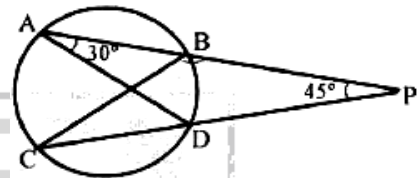
(a) $80^\circ, 65^\circ, 35^\circ$ (b) $65^\circ, 80^\circ, 35^\circ$
(c) $35^\circ, 80^\circ, 65^\circ$ (d) $80^\circ, 35^\circ, 65^\circ$

8. The bisectors of internal angles of a parallelogram form a _____.

(a) rectangle (b) rhombus
(c) square (d) parallelogram

9. Two chords AB and CD of a circle cut each other when produced outside the circle at P. AD and BC are joined.

If $\angle PAD = 30^\circ$ and $\angle CPA = 45^\circ$. Find $\angle CBP$.



(a) 105° (b) 115°
(c) 135° (d) None

10. Find the perimeter of an equilateral triangle whose area is $4\sqrt{3} \text{ cm}^2$.

(a) 12 cm (b) 8 cm
(c) 6 cm (d) 15 cm

11. The slant height of a cone is increased by P%. If radius remains same, the curved surface area is increased by

(a) P% (b) $P^2\%$
(c) $2P\%$ (d) None

12. The product of $\sqrt[3]{3} \times \sqrt[4]{3} \times \sqrt[12]{243}$ is

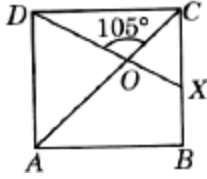
(a) $\sqrt{3}$ (b) 3
(c) $\sqrt[12]{3}$ (d) $\sqrt[144]{243}$

13. **Statement I:** If $(x - 3)$ is a factor of $2x^3 + kx^2 - 24x - 45$, then $k = -7$.

Statement II: If $(x - a)$ is a factor of $p(x)$, then $p(a) = 0$.

(a) Statement I is true, Statement II is false.
(b) Statement I is false, Statement II is true.
(c) Both Statement I and Statement II are true.
(d) Both Statement I and Statement II are false.

14. **Assertion (A):** In the given figure, if ABCD is a square, then the $\angle OXC = 65^\circ$.



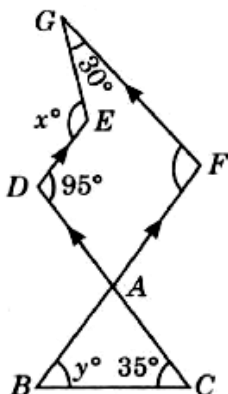
Reason (R): Diagonals of a square are equal and perpendicular.

- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
 (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
 (c) Assertion is true but reason is false.
 (d) Assertion is false but reason is true.

15. Match the Column.

	Column I		Column II
P.	$\sqrt[4]{\frac{1008}{63}} =$	1.	$\frac{29}{90}$
Q.	$2.\overline{6} - 0.\overline{82} =$	2.	2
R.	The simplest form of $0.\overline{32}$ is	3.	$\frac{3}{4}$
S.	$\left(\sqrt[6]{27} - \sqrt{6\frac{3}{4}}\right)^2 =$	4.	$\frac{182}{99}$

- (a) $P \rightarrow 4, Q \rightarrow 3, R \rightarrow 1, S \rightarrow 2$
 (b) $P \rightarrow 3, Q \rightarrow 4, R \rightarrow 2, S \rightarrow 1$
 (c) $P \rightarrow 2, Q \rightarrow 4, R \rightarrow 1, S \rightarrow 3$
 (d) $P \rightarrow 3, Q \rightarrow 2, R \rightarrow 4, S \rightarrow 1$
16. In the given figure, $DE \parallel AF$ and $AD \parallel FG$, based on this information, identify which of the following statements is/are correct?



- (A) The value of x is 125° .
 (B) The value of y is 75° .
 (C) The value of $x + y$ is 185° .
 (D) The value of $x - y$ is 65° .
 (a) A, B and C (b) B and C
 (c) B, C and D (d) A, C and D

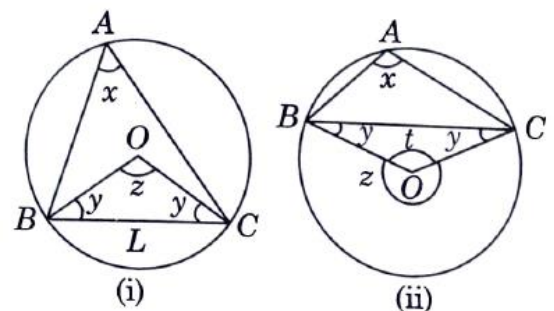
17. In which of the following the adjacent sides are not necessarily be equal?

- (A) Parallelogram (B) Rhombus
 (C) Rectangle (D) Square
 (a) A, B and D (b) A and C
 (c) B and D (d) A, C and D

18. It is given that $\triangle ABC \cong \triangle FDE$ and $AB = 5$ cm, $\angle B = 40^\circ$ and $\angle A = 80^\circ$ then which of the following statements is / are false?

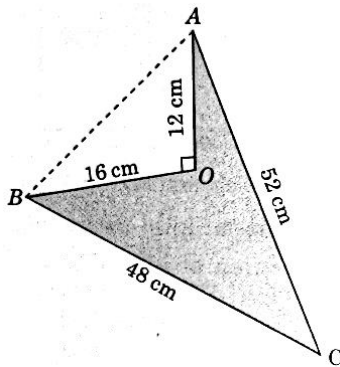
- (A) $DF = 5$ cm, $\angle F = 60^\circ$.
 (B) $DF = 5$ cm, $\angle E = 60^\circ$.
 (C) $DE = 5$ cm, $\angle E = 60^\circ$.
 (D) $DE = 5$ cm, $\angle D = 40^\circ$.
 (a) A, B and D (b) A and C
 (c) B and D (d) A, C and D

19. BC is a chord of a circle with centre O. A is a point on an arc BC as shown in the figures. Based on this information, identify which of the following statements is/are not correct?



- (A) The value of z in terms of x is $2x$.
 (B) If A is a point on the major arc, then $\angle BAC + \angle OBC = 120^\circ$.
 (C) If A is a point on the minor arc, then $\angle BAC - \angle OBC = 80^\circ$.
 (D) If A is a point on the minor arc, then $\frac{\angle BAC - \angle OBC}{2} = 45^\circ$.
 (a) A, B and C (b) B and C
 (c) B, C and D (d) A, C and D

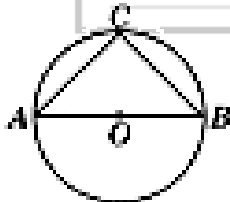
20. Sudha draw a $\triangle ABC$ as shown in the figure. She cut out right triangle AOB from it. Based on this information, identify which of the following statements is/are not correct?



- (A) The third side AB of $\triangle ABC$ is 20 cm.
 (B) The area of shaded part is 384 cm^2 .
 (C) The area of $\triangle AOB$ is 86 cm^2 .
 (D) The value of semi perimeter of $\triangle ABC$ is 50 cm.
- (a) A, B and C (b) B and C
 (c) C and D (d) A, C and D

SECTION B

21. **Statement I:** In the given figure, O is the centre of the circle and AOB is diameter, then $AB^2 - BC^2 - AC^2 = 0$.



Statement II: Angle in a semi-circle is a right angle.

- (a) Statement I is true, Statement II is false.
 (b) Statement I is false, Statement II is true.
 (c) Both Statement I and Statement II are true.
 (d) Both Statement I and Statement II are false.
22. **Assertion (A):** All the points $P(0, 3)$, $Q(0, -3)$, $R(3, 0)$ and $S(-3, 0)$ lie on axes.
Reason (R): Every point on x-axis is of the form $(a, 0)$ and every point on y-axis is of the form $(0, b)$.
- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
 (b) Both assertion and reason are true but reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

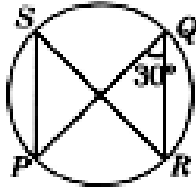
(d) Assertion is false but reason is true.

23. **Assertion (A):** The base radius of a cone is 7 cm and its slant height is 25 cm. The volume of the cone is 1232 cm^3 .

Reason (R): The volume of a right circular cone of base radius r and height h is $\frac{1}{3}\pi r^2 h$.

- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
 (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
 (c) Assertion is true but reason is false.
 (d) Assertion is false but reason is true.

24. Match the column I with column II and select the Correct answer by choosing an appropriate option.

	Column I		Column II
P.	The radius of a circle is 8 cm and the length of one of its chords is 12 cm. The distance of the chord from the centre is	1.	90°
Q.	The angle subtended in a semi circle is ____.	2.	12 cm
R.	In the given figure, P, S, Q and R are lie on the circle, such that $\angle PQR = 30^\circ$, then $\angle PSR$ is	3.	5.291 cm
			
S.	In a circle with centre O, if arc PQ and arc RS are congruent to each other and length of chord PQ is 12 cm, then RS is	4.	30°

- (a) $P \rightarrow 3, Q \rightarrow 1, R \rightarrow 4, S \rightarrow 2$
 (b) $P \rightarrow 3, Q \rightarrow 4, R \rightarrow 1, S \rightarrow 2$
 (c) $P \rightarrow 1, Q \rightarrow 2, R \rightarrow 3, S \rightarrow 4$
 (d) $P \rightarrow 1, Q \rightarrow 3, R \rightarrow 2, S \rightarrow 4$
- 25.** Which of the following statements is/are correct?
(A) Data which is collected for the first time by the statistical investigator or with the help of his workers is called primary data.
(B) These are the data already collected by a person or a society and these may be in published form. These type of data are known as raw data.
(C) When the data is compiled in the same form and order in which it is collected, it is known as secondary data.
(D) A quantity which can vary from one individual to another is called variable.
 (a) A and D (b) B and C
 (c) C and D (d) A, C and D
- SCIENCE BIOLOGY**
- SECTION A**
- 26.** Digestive Enzymes are found in:
 (a) Protoplasm (b) Cell wall
 (c) Lysosomes (d) Mitochondria
- 27.** Which of the following cell organelles functions both as an intracellular transport system and as a manufacturing surface?
 (a) Nucleus (b) Mitochondria
 (c) ER (d) None of these
- 28.** Who proposed the "Black Reaction"?
 (a) Benda (b) Camillo Golgi
 (c) None of them (d) Schleiden
- 29.** Which of the following can be made into crystal?
 (a) A bacterium (b) A virus
 (c) An amoeba (d) A sperm
- 30.** Which of the following are covered by a single membrane?
 (a) Mitochondria (b) Vacuole
 (c) Ribosome (d) Plastid
- 31.** Chromosomes are made up of:
 (a) DNA (b) Protein
 (c) DNA and protein (d) RNA
- 32.** Which of the following are formed in bone marrow?
 (a) RBC (b) Cartilage cell
 (c) Blood platelets (d) Fibres
- 33.** Aerenchyma is richly found in
 (a) Hydrophytes (b) Xerophytes
 (c) Helophytes (d) None of these
- 34.** How many micronutrients are required by plants?
 (a) 6 (b) 7
 (c) 10 (d) 12
- 35.** Stomata are not necessary for the diffusion of
 (a) Waste materials
 (b) CO_2
 (c) Water vapour
 (d) None of these
- 36.** Muscles are joined to the bones by
 (a) Ligament (b) Tendons
 (c) Areolar tissue (d) All of these
- 37.** The cells of sclerenchymatous tissue are:
 (a) dead (b) live
 (c) None of these (d) both of these
- 38. Statement I:** The endoplasmic reticulum which lacks ribosomes is called smooth endoplasmic reticulum.
Statement II: SER is mainly involved in protein synthesis.
 (a) Statement I is true Statement II is false.
 (b) Statement I is false Statement II is true.
 (c) Both Statement I and Statement II are true.
 (d) Both Statement I and Statement II are false
- 39. Assertion (A):** Prokaryotic cells are primitive and smaller than Eukaryotic cells.
Reason (R): Prokaryotic cells lack cytoplasmic organelles.
 (a) Both assertion and reason are true and reason is the correct explanation of assertion.
 (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
 (c) Assertion is true but reason is false.
 (d) Assertion is false but reason is true.

40. Match the column.

	Column-I		Column-II
P.	A method of plant breeding	1.	Protein factory
Q.	Mitochondria	2.	Cell wall
R.	Lysosome	3.	polyploidy
S.	Ribosome	4.	Power house of the cell
T.	Cellulose	5.	Suicidal bag

(a) $P \rightarrow 2, Q \rightarrow 4, R \rightarrow 3, S \rightarrow 1, T \rightarrow 5$

(b) $P \rightarrow 3, Q \rightarrow 4, R \rightarrow 5, S \rightarrow 1, T \rightarrow 2$

(c) $P \rightarrow 5, Q \rightarrow 3, R \rightarrow 1, S \rightarrow 4, T \rightarrow 2$

(d) $P \rightarrow 1, Q \rightarrow 2, R \rightarrow 3, S \rightarrow 4, T \rightarrow 5$

41. Which of the following statements are correct?

(A) Xylem conducts organic solutes and phloem conducts water and inorganic solutes.

(B) Xylem provides mechanical strength and phloem doesn't provide mechanical strength.

(C) Tracheids and vessels are conducting channels in xylem. Sieve tubes are conducting channels in phloem.

(D) Conduction is bidirectional in phloem whereas unidirectional in xylem.

(a) A and B

(b) B and D

(c) C and D

(d) A and D

42. Which of the following statements are not correct?

(A) Manure is biodegradable where fertilisers are nonbiodegradable.

(B) Manures are absorbed quickly.

(C) Manures are nutrient specific.

(D) Manures provide humus to the soil whereas fertilisers don't provide humus to the soil.

(a) A and D

(b) B and C

(c) A and B

(d) A, B and D

43. Which of the following statements is/ are incorrect?

(A) The process of crossing two genetically different Plants to obtain a hybrid is called plant breeding.

(B) The technique of growing two or more crops simultaneously in a define row pattern in the same field is known as mixed cropping.

(C) Berseem is as example of plantation crop.

(D) Kharif crops are grows from June to October.

(a) A and D

(b) B and C

(c) A and B

(d) A, B and D

44. Which of the following is/are the example(s) of exosmosis?

(A) Absorption of water by roots of plants from the soil.

(B) Loss of water from cucumber after sprinkling salt on it.

(C) Swelling of raisins in water.

(D) The movement of water from roots to the xylem vessels.

(a) A and C

(b) B only

(c) C Only

(d) C and D

45. Which of the following are components of crop production management?

(A) Nutrient Management

(B) Weed control

(C) Hybridisation

(D) Irrigation

(E) Cropping patterns

(a) B, C and D

(b) A, B and D

(c) A, D and E

(d) A, C and D

SECTION B

46. **Statement I:** A cell membrane shows fluid behaviour.

Statement II: A membrane is a mosaic of lipids and proteins.

(a) Statement I is true, Statement II is false.

(b) Statement I is false, Statement II is true.

(c) Both Statement I and Statement II are true.

(d) Both Statement I and Statement II are false.

47. **Assertion (A):** Cells having cell wall withstand very dilute (hypotonic) external media without bursting.

Reason (R): The cell wall exerts an equal pressure against the swollen cell.

- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
- (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) Assertion is true but reason is false.
- (d) Assertion is false but reason is true.

48. **Assertion (A):** In composite fish farming, there is no competition among fishes because they feed at different levels.

Reason (R): Rohu and Catla are surface feeders whereas Mrigala and Common Carp are bottom feeders.

- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
- (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) Assertion is true but reason is false.
- (d) Assertion is false but reason is true.

49. Match the column.

	Column-I		Column-II
P.	Connective tissue	(i)	Sclerenchyma
Q.	Nervous tissue	(ii)	Voluntary as well as involuntary muscles
R.	Coir of coconut	(iii)	Involuntary muscles
S.	Muscles of the heart	(iv)	Phloem
T.	Eyelid	(v)	Neuron
		(vi)	Blood

- (a) $P \rightarrow 4, Q \rightarrow 5, R \rightarrow 1, S \rightarrow 3, T \rightarrow 2$
- (b) $P \rightarrow 5, Q \rightarrow 3, R \rightarrow 2, S \rightarrow 1, T \rightarrow 4$
- (c) $P \rightarrow 3, Q \rightarrow 2, R \rightarrow 4, S \rightarrow 1, T \rightarrow 5$
- (d) $P \rightarrow 5, Q \rightarrow 1, R \rightarrow 2, S \rightarrow 4, T \rightarrow 3$

50. Which of the following are external parasites?

- (A) Lice
- (B) Ticks
- (C) Mites
- (a) A only (b) B, C
- (c) A, B (d) A, B, C

SCIENCE CHEMISTRY

SECTION A

51. The mass per unit volume of a substance is:

- (a) acceleration (b) density
- (c) velocity (d) weight

52. What is dry ice?

- (a) Solid carbon dioxide
- (b) Nitrogen oxide
- (c) Carbon mono oxide
- (d) None of them

53. Which of the following state is responsible for the glow in the sun and stars?

- (a) Solid (b) Liquid
- (c) Plasma (d) Gas

54. The major component of a solution is called:

- (a) solute (b) insoluble
- (c) solvent (d) solution

55. Which of the following will show the "Tyndall effect"?

- (a) Salt solution
- (b) Milk and starch solution
- (c) Copper sulphate solution
- (d) None of them

56. The size of colloidal particles are:

- (a) $10^{-4} - 10^{-8}$ m (b) $10^{-10} - 10^{-12}$ m
- (c) $10^{-2} - 10^{-4}$ m (d) $10^{-9} - 10^{-6}$ m

57. Elements belonging to different groups of the periodic table are given below. If the element X forms a chloride whose formula is 'XCl₂' then element 'X' belongs to the group whose representative element is:

- (a) Al (b) Na
- (c) Mg (d) Si

58. Identify the incorrect statement.
- The building blocks of all matter are atoms.
 - Atoms are very small. They cannot be seen by the naked eye.
 - The size of an atom is expressed in metres.
 - An atom of hydrogen has the radius of the order of 10^{-10} m.
59. Which of the following statements is not true about an atom?
- Atoms are not able to exist independently.
 - Atoms are the basic units from which molecules and ions are formed.
 - Atoms are always neutral in nature.
 - Atoms aggregate in large numbers to form the matter that we can see, feel or touch.
60. An atom with 3 protons and 4 neutrons will have a valency of:
- 3
 - 7
 - 1
 - 4
61. The electron distribution in an aluminium atom is:
- 2, 8, 3
 - 2, 8, 2
 - 8, 2, 3
 - 2, 3, 8
62. The electronic configuration of elements A, B, C and D are (2, 8, 1), (2, 8, 2), (2, 8, 6) and (2, 8, 7) respectively. Which of them can make an ion with two negative charges?
- A
 - B
 - C
 - D
63. **Statement I:** The valency of aluminium is 3 and oxygen is 2.
Statement II: The chemical formula of aluminium oxide is Al_3O_2 .
- Statement I is true Statement II is false.
 - Statement I is false Statement II is true.
 - Both Statement I and Statement II are true.
 - Both Statement I and Statement II are false.
64. **Assertion (A):** When a beam of light is passed through a colloidal solution placed in a dark place the path of the beam becomes visible.
Reason (R): Light gets scattered by the colloidal particles.
- Both assertion and reason are true and reason is the correct explanation of assertion.
 - Both assertion and reason are true but reason is not the correct explanation of assertion.
 - Assertion is true but reason is false.
 - Assertion is false but reason is true.
65. Match the column.
- | | Column-I | | Column-II |
|------|----------|------|------------|
| (P). | Proton | (1). | Thomson |
| (Q). | Electron | (2). | Goldstein |
| (R). | Neutron | (3). | Rutherford |
| (S). | Nucleus | (4). | Chadwick |
- $P \rightarrow 2, Q \rightarrow 4, R \rightarrow 3, S \rightarrow 1$
 - $P \rightarrow 2, Q \rightarrow 3, R \rightarrow 1, S \rightarrow 4$
 - $P \rightarrow 2, Q \rightarrow 1, R \rightarrow 4, S \rightarrow 3$
 - $P \rightarrow 1, Q \rightarrow 2, R \rightarrow 3, S \rightarrow 4$
66. Select the correct statements.
- An atom is divisible and consists of charged particles.
 - It was known by 1900 that the atom was not a simple, indivisible particle but contained atleast one sub-atomic particle - the electron.
 - E. Goldstein in 1886 discovered the presence of new radiations called canal rays which led to the discovery of another sub atomic particle – the proton.
 - Proton had a charge, equal in magnitude but opposite in sign to that of the electron and its mass was approximately 2000 times as that of the electron.
 - The mass of an electron is considered to be negligible and its charge is minus one.
- (A), (B) and (C)
 - (C), (D) and (E)
 - (B), (C) and (D)
 - All the statements are correct.

67. Dalton's atomic theory successfully explained
 (A) law of conservation of mass
 (B) law of constant composition
 (C) law of radioactivity
 (D) law of multiple proportion.
 (a) (A), (B) and (C) (b) (A), (C) and (D)
 (c) (B), (C) and (D) (d) (A), (B) and (D)
68. Identify the incorrect statement about evaporation.
 (A) It causes cooling.
 (B) It increases with increase in humidity.
 (C) It decreases with increase in temperature.
 (D) It increases with increase in wind speed.
 (a) (B) and (C) (b) (A), (B) and (C)
 (c) (A) and (B) (d) All of these
69. Which of the following are physical changes?
 (A) Melting of iron metal
 (B) Rusting of iron
 (C) Bending of an iron rod
 (D) Drawing a wire of iron metal
 (a) (A), (B) and (C) (b) (A), (B) and (D)
 (c) (A), (C) and (D) (d) (B), (C) and (D)
70. Identify the correct statements.
 (A) In a compound such as water, the ratio of the mass of hydrogen to the mass of oxygen is always 8 : 1.
 (B) If 9 g of water is decomposed, 1 g of hydrogen and 8 g of oxygen are always obtained.
 (C) In ammonia, nitrogen and hydrogen are always present in the ratio 3 : 14 by mass.
 (D) Many compounds are composed of two or more elements and each such compound has the same elements in the same proportions.
 (a) (A) and (C) (b) (A), (B) and (C)
 (c) (B) and (D) (d) All of these

SECTION B

71. **Statement I:** Thomson's atomic model is known as raisin pudding model.
Statement II: The atom is visualized as a pudding of positive charge with electrons (raisins) embedded in it.
 (a) Statement I is true Statement II is false.
 (b) Statement I is false Statement II is true.

- (c) Both Statement I and Statement II are true.
 (d) Both Statement I and Statement II are false.
72. **Assertion (A):** Atomicity of ozone is three while that of oxygen is two.
Reason (R): Atomicity is the number of atoms constituting a molecule.
 (a) Both assertion and reason are true and reason is the correct explanation of assertion.
 (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
 (c) Assertion is true but reason is false.
 (d) Assertion is false but reason is true.
73. **Assertion (A):** A solution of table salt in a glass of water is homogeneous.
Reason (R): A solution having different composition throughout is homogeneous.
 (a) Both assertion and reason are true and reason is the correct explanation of assertion.
 (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
 (c) Assertion is true but reason is false.
 (d) Assertion is false but reason is true.
74. Match the column.

	Column-I (Molecule)		Column-II (Mass ratio of elements)
(P).	Water (H : O)	(1).	14 : 3
(Q).	Ammonia (N : H)	(2).	1 : 8
(R).	Carbon dioxide (C : O)	(3).	1 : 1
(S).	Sulphur dioxide (S : O)	(4).	3 : 8

- (a) $P \rightarrow 2, Q \rightarrow 1, R \rightarrow 4, S \rightarrow 3$
 (b) $P \rightarrow 2, Q \rightarrow 3, R \rightarrow 1, S \rightarrow 4$
 (c) $P \rightarrow 2, Q \rightarrow 3, R \rightarrow 4, S \rightarrow 1$
 (d) $P \rightarrow 1, Q \rightarrow 2, R \rightarrow 3, S \rightarrow 4$

75. Which of the following statements is correct for the solid state?
- (A) The constituent particles are closely packed.
 (B) The attracting forces are very strong.
 (C) The movement of constituent particle is restricted.
 (D) They do have fixed shape.
- (a) A and B (b) A, B and C
 (c) Only D (d) All of these

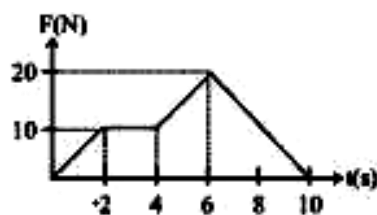
SCIENCE PHYSICS

SECTION A

76. Wave I and II are propagating with speeds 200 m/s and 500 m/s respectively. The wavelength of Wave I is 10 times smaller than that of Wave II. The ratio of time period of Wave II to that of Wave I is:
- (a) 1 : 1 (b) 2 : 5
 (c) 1 : 4 (d) 4 : 1
77. An athlete completes two and a half rounds of a circular track of radius 'R' in time 't'. The average speed of athlete is:

- (a) $\frac{5\pi R}{t}$ (b) $\frac{2R}{t}$
 (c) $\frac{2\pi R}{t}$ (d) $\frac{\pi R}{t}$

78. A particle of mass 5 kg is at rest initially. A force acts on it whose magnitude changes with time. The force time graph is shown below. The velocity of the particle after 10 sec is



- (a) 100 m/s (b) 80 m/s
 (c) 20 m/s (d) 60 m/s
79. Two balls of same mass and identical in shape and size are allowed to fall from two different heights 16m and 64m. Then, the ratio of their momenta just before striking the ground is:
- (a) 1 : 1 (b) 1 : 2
 (c) 1 : 4 (d) 1 : 16

80. A particle experiences a constant acceleration for 20 sec after starting from rest. If it travels a distance s_1 in the first 10 sec and a distance s_2 in the next 10 sec, then

- (a) $s_1 = s_2$ (b) $s_1 = \frac{s_2}{3}$
 (c) $s_1 = \frac{s_2}{2}$ (d) $s_1 = \frac{s_2}{4}$

81. Force of 5N acts on a body of weight 9.8N. What is the acceleration produced in ms^{-2} ?

- (a) 49 (b) 5
 (c) 1.46 (d) 0.51

82. A marble of mass 'm' is dropped from a height 'h' on a hard floor. If it rebounds to the same height, the change in momentum of marble is:

- (a) $m\sqrt{2gh}$ (b) $2m\sqrt{2gh}$
 (c) $3m\sqrt{2gh}$ (d) $4m\sqrt{2gh}$

83. In 5 seconds, 25 wavelengths of a wave pass a certain point. What is the wave's frequency?

- (a) 0 Hz (b) 1 Hz
 (c) 5 Hz (d) 10 Hz

84. If suddenly the gravitational force of attraction between earth and a satellite revolving around it becomes zero, then the satellite will:

- (a) continue to move in its orbit with same velocity.
 (b) move tangentially to the original orbit with the same velocity.
 (c) become stationary in its orbit.
 (d) move towards the earth.

85. Two men with their weights in the ratio 5 : 3 run up a staircase in times in the ratio 11 : 9. Then the ratio of power of first to that of second is:

- (a) $\frac{15}{11}$ (b) $\frac{11}{15}$
 (c) $\frac{11}{9}$ (d) $\frac{9}{11}$

86. If the magnitude of momentum of a certain body be increased by 50%, its kinetic energy will increase by:

- (a) 125% (b) 150%
 (c) 50% (d) 62.5%

87. Which of the following is not a unit of work?

- (a) newton $\times$ metre
 (b) joule
 (c) $\frac{\text{kilogram} \times (\text{meter})^2}{(\text{second})^3}$
 (d) $\frac{\text{kilogram} \times (\text{meter})^2}{(\text{second})^2}$

88. **Statement I:** When the displacement of a body is directly proportional to the square of time, body is said to be moving with uniform acceleration.

Statement II: The slope of displacement-time graph with time axis gives acceleration.

- (a) Statement I is true, Statement II is false.
 (b) Statement I is false, Statement II is true.
 (c) Both Statement I and Statement II are true.
 (d) Both Statement I and Statement II are false.

89. **Assertion (A):** A body is momentarily at rest when it reverses the direction.

Reason (R): A body cannot have acceleration if its velocity is zero at a given instant of time.

- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
 (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
 (c) Assertion is true but reason is false.
 (d) Assertion is false but reason is true.

90. Match the column.

	Column-I		Column-II
P.	Newton's first law	1.	Propulsion of a rocket
Q.	Newton's second law	2.	Stable equilibrium of a body
R.	Newton's third law	3.	Law of force
S.	Law of conservation of linear momentum	4.	Flying nature of bird

- (a) $P \rightarrow 2, Q \rightarrow 4, R \rightarrow 3, S \rightarrow 1$
 (b) $P \rightarrow 2, Q \rightarrow 3, R \rightarrow 1, S \rightarrow 4$
 (c) $P \rightarrow 2, Q \rightarrow 3, R \rightarrow 4, S \rightarrow 1$
 (d) $P \rightarrow 1, Q \rightarrow 2, R \rightarrow 3, S \rightarrow 4$

91. Which of the following statements regarding motion are true?

- (A) A body can accelerate if there is a change in its speed but not direction.
 (B) A body can accelerate if there is a change in direction but not speed.
 (C) A body can accelerate if there is a change in both speed and direction.
 (D) A body can accelerate only if there is a change in direction of motion.

- (a) C and D (b) A, B and D
 (c) B and C (d) A, B and C

92. Which of the following statements correctly describe balanced forces?

- (A) They can produce acceleration in a body.
 (B) They can change the shape and size of a body.
 (C) They can create rotation when applied at different points on an object.
 (D) They do not produce any acceleration.

- (a) B and D (b) A, B and C
 (c) B, C and D (d) A, C and D

93. Which of the following statements regarding gravitational force are incorrect?

- (A) It is a very strong force.
 (B) It is always attractive in nature.
 (C) It is inversely proportional to the product of masses of two bodies.
 (D) It depends upon the medium through which it acts.

- (a) A, C and D (b) B, C and D
 (c) A and C (d) C and D

94. Which statements hold true for a ball thrown upward from a point P and reaching the highest point Q.

- (A) Kinetic energy at P is equal to kinetic energy at Q.
 (B) Potential energy at P is equal to kinetic energy at Q.
 (C) Kinetic energy at P is equal to potential energy at Q.
 (D) The sum of kinetic energy and potential energy at any point between P and Q is constant.

- (a) A and B (b) B and C
(c) C and D (d) A and C
95. Which of the following statements are incorrect?
- (A) A longitudinal wave is represented graphically by a density- distance graph.
- (B) In a wave, molecules or particles of a medium are transferred from one point to another.
- (C) In a transverse wave, the particles of the medium vibrate in the direction of propagation of the wave.
- (D) A longitudinal wave travels in the form of alternate crests and troughs.
- (a) A, B and C
(b) B and D
(c) B and C
(d) B, C and D

SECTION B

96. **Statement I:** Weight of a body is independent of the mass of the body.
Statement II: Weight is a vector quantity.
- (a) Statement I is true, Statement II is false.
(b) Statement I is false, Statement II is true.
(c) Both Statement I and Statement II are true.
(d) Both Statement I and Statement II are false.
97. **Assertion (A):** When the force retards the motion of a body, the work done is zero.
Reason (R): Work done depends on angle between force and displacement.
- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true but reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Assertion is false but reason is true.

98. **Assertion (A):** The velocity of sound increases with increase in humidity.

Reason (R): Velocity of sound does not depend upon the medium.

- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true but reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Assertion is false but reason is true.

99. Match the column.

	Column-I		Column-II
P.	Elephants	1.	Reflection of sound
Q.	Ultrasound	2.	Infrasonic waves
R.	Sonar	3.	Multiple reflection of sound
S.	Reverberation	4.	Welding purpose

- (a) $P \rightarrow 2, Q \rightarrow 4, R \rightarrow 1, S \rightarrow 3$
(b) $P \rightarrow 3, Q \rightarrow 1, R \rightarrow 4, S \rightarrow 2$
(c) $P \rightarrow 2, Q \rightarrow 1, R \rightarrow 3, S \rightarrow 4$
(d) $P \rightarrow 3, Q \rightarrow 2, R \rightarrow 4, S \rightarrow 1$

100. Which of the following statements are incorrect?

- (A) When force acts in a direction opposite to the displacement, then work done is zero.
(B) A weightlifter does work in lifting the weight off the ground, but does no work in holding the weight up.
(C) Work done can be positive, negative or zero, hence it is a vector quantity.
(D) Work done depends upon the magnitude of force applied.
- (a) A, and B (b) C and D
(c) A and C (d) B and D

ANSWER KEY

Q	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans	c	a	c	b	d	c	a	a	a	a	a	b	b	d	c	d	b	d	c	c
Q	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans	c	a	a	a	a	c	c	b	b	b	c	a	a	b	a	b	a	a	a	b
Q	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans	b	b	b	b	c	c	a	c	a	d	b	a	c	c	b	d	c	c	a	c
Q	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans	a	c	a	a	c	d	d	a	c	c	c	a	c	a	d	d	a	a	b	b
Q	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans	b	b	c	b	a	a	c	a	c	c	d	c	a	c	d	b	c	c	a	c



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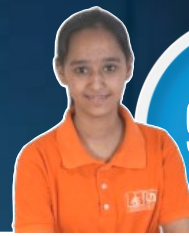


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