

HAVE CONTROL → HAVE PATIENCE → HAVE CONFIDENCE ⇒ 100% SUCCESS

BEWARE OF NEGATIVE MARKING

MENTAL ABILITY

This section contains **30 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

- 'L % M' means that M is brother of L
 'L × M' means that L is mother of M
 'L ÷ M' means that L is the sister of M
 'L = M' means that M is father of L
 Which of the following means "I is the nephew of Q"?

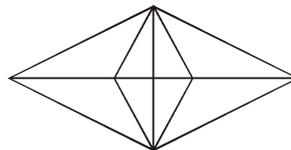
(i) $Q \% J = I$
 (ii) $Q \div M \times B \% I$
 (iii) $C \div I = B \% Q$

(1) Only (iii) (2) Only (i) (3) Only (ii) (4) (i) and (iii)
- If the Republic day of India in 1980, falls on Saturday, X was born on March 3, 1980 and Y is older to X by four days, then Y's birthday fell on

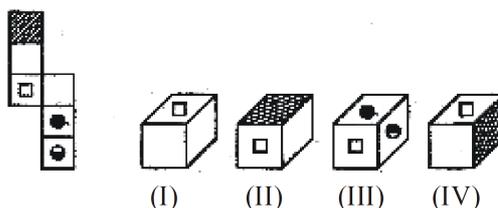
(1) Thursday (2) Friday (3) Wednesday (4) Saturday
- Two clocks are set correctly at 9 am on Monday. Both the clocks gain 3 min and 5 min respectively in an hour. What time will the second clock register, if the first clock which gains 3 min in an hour shows the time as 27 min past 6 pm on the same day?

(1) 6 : 27 pm (2) 6 : 45 pm (3) 6 : 25 pm (4) 6 : 50 pm
- According to a code : 'pon con non bon' means 'some persons are cheats', 'fon pon gon hon' means 'cheats can be dangerous', 'Ion kon fon con' means ' Dangerous persons might kill', 'bon gon hon kon' means 'some probably can kill'. The codes for 'some dangerous cheats' would be :

(1) kon bon hon (2) hon yon fon (3) fon bon pon (4) bon hon pon
- How many triangles are there in the figure ?



- (1) 20 (2) 22 (3) 24 (4) 26
- In the question given below, an unfolded dice is given in the left side while in the right side four answer choices are given in the form of complete dices. You are required to select the correct answer choice(s) which is/are formed by folding the unfolded dice.

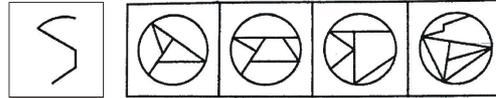


- (1) I and II (2) I and III (3) II and III (4) I, II and IV

7. One day, Vikram and Shailesh were standing in a lawn with their backs towards each other. Vikram's shadow fell exactly towards left hand side. Which direction was Shailesh facing:

- (1) South (2) West
(3) North (4) Can't be determined

8. Find out the alternative figure which contains figure (X) as its parts.



(X) (a) (b) (c) (d)

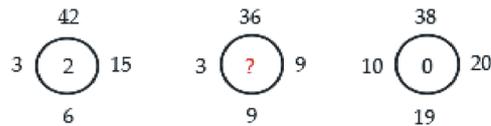
- (1) a (2) b (3) c (4) d

9. Select the correct combination of mathematical signs to replace * signs and the balance the following equation

$$8 * 8 * 1 * 7 = 8$$

- (1) $\times \div +$ (2) $+ \div \times$ (3) $\div \times +$ (4) $+ \times \div$

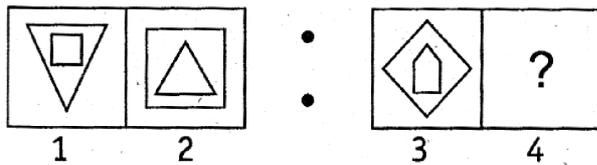
10. What value replaces "?" in the below figure ?



- (1) 4 (2) 3 (3) 2 (4) 1

11. The second figure in the first unit of the problem figures bears a certain relationship to the first figure. Similarly, one of the figure in the answer figures bears the same relationship to the first figure in the second unit of the problem figures. You have to select that from the set of answer figure which would come in the place of question mark (?)

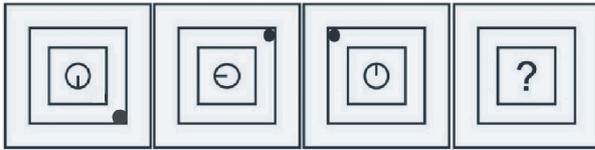
Problem Figures



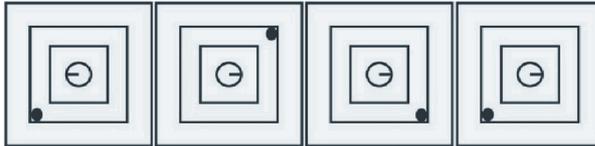
- (1) (2)
(3) (4)

12. Find the next figure of the series.

Problem Figures



Answers Figures



(1) (2) (3) (4)

13. In a class of 45 students, a boy is ranked 20th. When two boys joined, his rank was dropped by one. What is his new rank from the end ?

(1) 25th (2) 26th (3) 27th (4) 28th

14. Study the following information and answer the question given below it.

A blacksmith has five iron articles A, B, C, D and E, each having a different weight.

- I. A weighs twice as much as B.
- II. B weighs four-and-a-half times as much as C.
- III. C weighs half as much as E.
- IV. D weighs three fourth of E.
- V. E weighs less than A but more than C.

Which of the following is the lightest in weight:

(1) A (2) B (3) C (4) D

15. Five boys A_1, A_2, A_3, A_4 and A_5 are sitting on a stair in the following way

- I. A_5 is above A_1 .
- II. A_4 is under A_2 .
- III. A_2 is under A_1 .
- IV. A_4 is between A_2 and A_3 .

Who is at the lowest position of the stair?

(1) A_1 (2) A_3 (3) A_5 (4) A_2

16. **Direction :** In the question below are given two statements followed by two conclusions numbered I and II. You have to take the two given statements to be true even if they seem to be at variance from commonly known facts and decide which of the given conclusion(s) logically follow(s) from the two given statements, disregarding commonly known facts.

Statements : Some rats are cats.

All cats are bats.

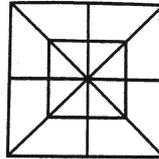
Conclusions : I. No rats are cats.

II. Some rats are bats.

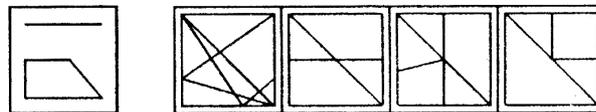
Given answer :

- (1) If only conclusion I follows (2) If only Conclusion II follows
(3) If neither I nor II follows (4) If both I and II follow

17. Introducing a man, a woman said, "His wife is the only daughter of my father". How is the man related to woman ?
 (1) Brother (2) Father-in-law (3) Uncle (4) Husband
18. What was the day of the week on 28th May, 2006?
 (1) Sunday (2) Friday (3) Wednesday (4) Tuesday
19. A watch loses 5 seconds in one hour and was set right at 7am. What time will it show at 2 pm on the same day?
 (1) 1:50:25 pm. (2) 1:59:00 pm. (3) 1:59:25 pm. (4) 1:00:25 pm.
20. In a code language if POSE is coded as OQNPRTDF, then the word TYPE will be coded as:
 (1) SUXZOQFD (2) SUXZQOFD (3) SUXZOQDF (4) SUXZQODE
21. Find the number of Triangles and Squares in the given figure.

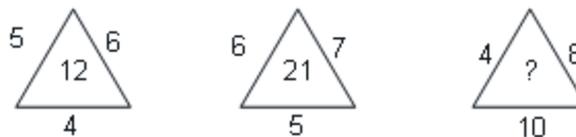


- (1) 28 triangles, 10 squares (2) 28 triangles, 8 squares
 (3) 32 triangles, 10 squares (4) 32 triangles, 8 squares
22. A dice is numbered from 1 to 6 in different ways. If 1 is adjacent to 2, 3 and 5, then which of the following statements is necessarily true?
 (1) 4 is adjacent to 6 (2) 2 is adjacent to 5
 (3) 1 is adjacent to 6 (4) 1 is adjacent to 4
23. A boy starts walking towards South. After walking 200 m he turns left and walks 100 m straight. Again, he turns left and walks 200 m. Next he turns right and walks a distance of 500 m. How far is he from the starting point finally?
 (1) 600 m (2) 1000 m (3) 100 m (4) 400 m
24. In the given question, choose the alternative figure in which the question figure (X) is embedded.



(X) (1) (2) (3) (4)

25. If θ means +, ϕ means \div and β means \times , find the value of $119 \phi 17 \theta 7 \beta 4$.
 (1) 96 (2) 63 (3) 35 (4) 33
26. Find the missing term:

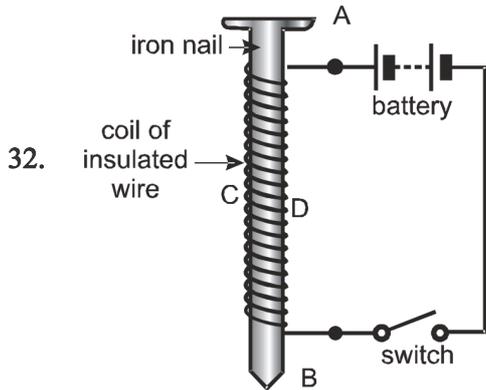


- (1) 22 (2) 23 (3) 28 (4) 32

PHYSICS

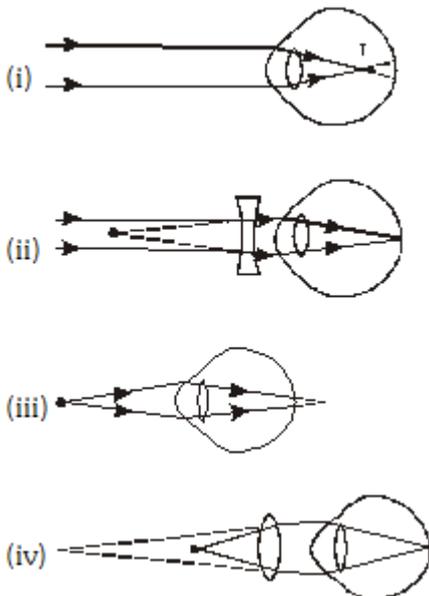
This section contains **30 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

31. Three resistances 2Ω , 3Ω and 6Ω are connected in parallel to a 20 V battery. The electric current in circuit is -
- (1) 10 A (2) 2 A (3) 3 A (4) 20 A



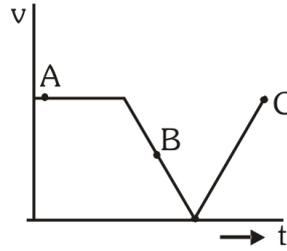
Which of the following will behave as north pole, when switch will be closed.

- (1) Point A (2) Point B (3) Point C (4) Point D
33. A stone is released from an elevator going up with an acceleration a . The acceleration of stone after the release is -
- (1) a upward (2) $(g - a)$ upward (3) $(g - a)$ downward (4) g downward
34. Figure (i), (ii), (iii) and (iv) respectively correspond to :



- (1) The short-sighted eye, the correction of long-sight, the long-sighted eye and the correction of short-sight
- (2) The short-sighted eye, the correction of short-sight, the long-sighted eye and the correction of long-sight
- (3) The long-sighted eye, correction of short-sight, the short-sighted eye and the correction of long-sight
- (4) correction of short-sight, The long-sighted eye, the short-sighted eye and the correction of long-sight

35. The velocity time graph of a body is shown in figure. It implies that at point B



- (1) Force is zero (2) Force is towards motion
(3) Force is opposite to motion (4) Velocity is negative
36. A concave mirror gives an image three times as large as the object placed at a distance of 20 cm from it. For the image to be real, the focal length should be :

- (1) 10 cm (2) 15 cm (3) 20 cm (4) 30 cm

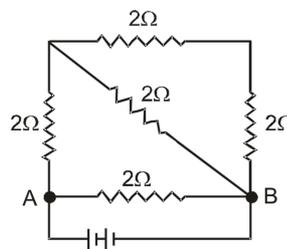
37. The total work done on a particle is equal to the change in its kinetic energy This is applicable

- (1) Always
(2) Only if the conservative forces are acting on it
(3) Only in inertial frames
(4) Only when pseudo forces are absent

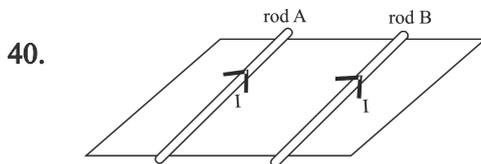
38. A virtual image smaller than the object can be formed by :

- (1) Convex lens (2) Convex mirror (3) Concave mirror (4) Plane mirror

39. Equivalent resistance of the circuit shown above will be :



- (1) 3.33 Ω (2) 1.25 Ω (3) 2.5 Ω (4) 4 Ω



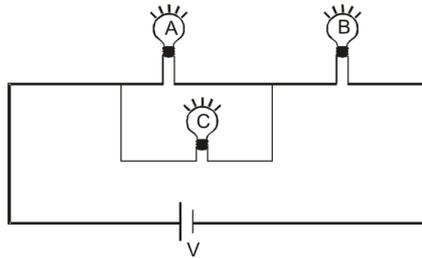
In the given figure, force on rod A and rod B are in direction respectively :

- (1) Rightward direction, Leftward direction (2) Rightward direction, Rightward direction
(3) Leftward direction, Leftward direction (4) Leftward direction, Rightward direction
41. A battery is used to :
- (1) Maintain a potential difference (2) Measure electric current
(3) Measure electric potential (4) Safeguard against short circuit

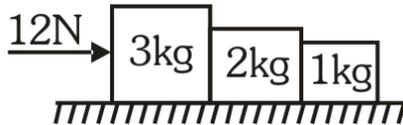
42. A bomb explodes on the moon. On the earth-
- (1) we will hear the sound after 10 minutes
 - (2) we will hear the sound after 2 hours 18 minutes,
 - (3) we will hear the sound after 37 minutes.
 - (4) we can not hear the sound of explosion

43. If the current is flowing clockwise in a circular coil the direction of lines of force inside the coil is:
- (1) Towards you
 - (2) Away from you
 - (3) Towards the centre along the radius
 - (4) Away from the centre along the radius

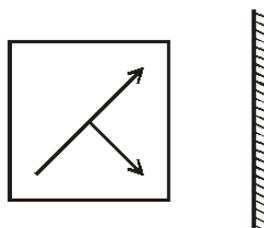
44. A, B and C are identical bulbs. What happens to the brightness of A and C if bulb B is fused.



- (1) Brightness of both increases
 - (2) Brightness of A increases and C decreases
 - (3) Brightness of B increases and A decreases
 - (4) Both bulb will not glow
45. Three blocks of masses 3 kg, 2 kg and 1 kg are placed side by side on a smooth surface as shown in figure. A horizontal force of 12 N is applied to 3 kg block. The net force on 2 kg block is—

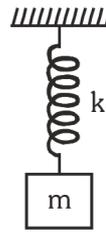


- (1) 2 N
 - (2) 4 N
 - (3) 6 N
 - (4) 12 N
46. Choose the correct mirror-image of figure given below.



- (1)
- (2)
- (3)
- (4)

47. Initially mass m is held such that spring is in relaxed condition. If mass m is suddenly released, maximum elongation in spring will be

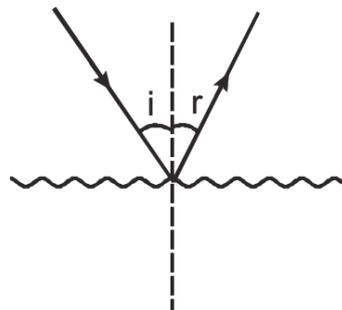


- (1) $\frac{mg}{k}$ (2) $\frac{2mg}{k}$ (3) $\frac{mg}{2k}$ (4) $\frac{mg}{4k}$
48. The refractive index of water is 1.33. What will be the speed of light in water?
- (1) 3×10^8 m/s (2) 2.25×10^8 m/s (3) 4×10^8 m/s (4) 1.33×10^8 m/s

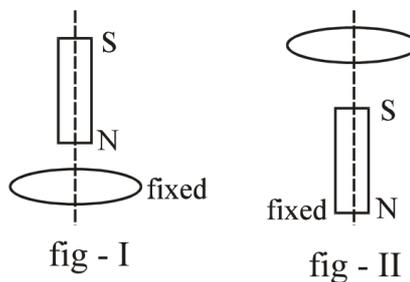
49. Flow of electric current is considered:

- (1) In the direction of flow of electrons (2) In the direction opposite to flow of electrons
- (3) In any direction (4) In the direction of negative ion

50. For the following ray diagram choose the correct option :



- (1) $\angle i < \angle r$ (2) $\angle i = \angle r$ (3) $\angle i > \angle r$ (4) can't say
51. A vertical bar magnet is dropped from position on the axis of a fixed metallic coil as shown in fig - I. In fig - II, the magnet is fixed and horizontal coil is dropped. The acceleration of the magnet and coil are a_1 and a_2 respectively then :



- (1) $a_1 > g, a_2 > g$ (2) $a_1 > g, a_2 < g$ (3) $a_1 < g, a_2 < g$ (4) $a_1 < g, a_2 > g$
52. A 9 cm needle is placed 24 cm away from a convex mirror of focal length 30 cm. The height of image is—
- (1) 5 cm (2) 4.5 cm (3) 18 cm (4) 45 cm

53. If length of a cylindrical conducting wire is doubled and area of cross section is halved, the resistance of the wire becomes :

- (1) Double (2) Half (3) 4 times (4) $\frac{1}{4}$ times

54. A charged particle moves through a region having only magnetic field directed perpendicular to its direction of motion. Which of the following quantities of the particle will not change?

- (1) Momentum (2) Speed (3) Velocity (4) Acceleration

55. Joule/coulomb is the unit of :

- (1) Electric potential (2) Current
(3) Force (4) Work

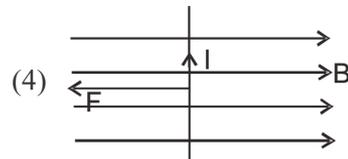
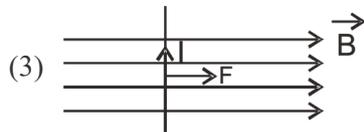
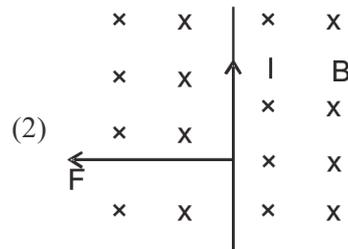
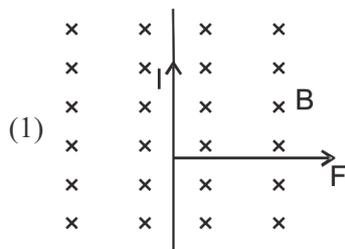
56. Which of the following colour of light will have maximum speed in water :

- (1) Red (2) Violet (3) Blue (4) Yellow

57. Which of the following statement is wrong :

- (1) Ammeter is a device used to measure current (2) Resistance of voltmeter is small
(3) Resistance of Ammeter is small (4) Resistance of voltmeter is very large

58. Which of the given figures is correct :



59. The term refraction of light is :

- (1) The bending of light rays when it enter from one medium to another medium
(2) Splitting of white light into seven colours when it passes through the prism
(3) Bending of light round corners of obstacles and apertures
(4) Coming back of light after striking a bright smooth surface

60. A thin lens has more focal length, then its power will be :

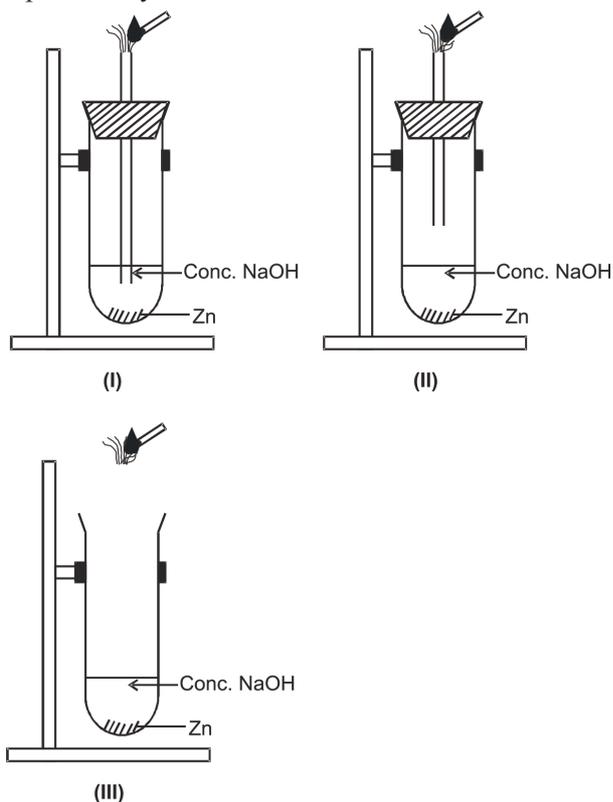
- (1) More (2) Less (3) Zero (4) Infinity

CHEMISTRY

This section contains **30 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

61. Pick out the correct statement of the following.
- (1) Formation of compounds involves energy change.
 - (2) Constituents of a chemical compounds can be separated mechanically.
 - (3) Compounds have not fixed density.
 - (4) Compounds do not have fixed mass ratio of its elements
62. The average atomic mass of an element X is 80 u. The percentage of isotopes ${}_{35}\text{X}^{79}$ and ${}_{35}\text{X}^{82}$ in the sample is
- (1) 90.99 and 9.01
 - (2) 80.8 and 19.2
 - (3) 66.67 and 33.34
 - (4) 50 and 50
63. Identify the correct statement.
- (1) ${}^6_{14}\text{C}$ and ${}^7_{14}\text{N}$ shows different chemical reactivity due to difference in atomic masses.
 - (2) A neutron is formed by an electron and a proton combining together. Therefore it is neutral.
 - (3) Mass of an electron is about 1840 times that of proton.
 - (4) Each energy level in an atom is associated with a fixed amount of energy.
64. Observe the following reaction.
- $$\text{Ca(OH)}_2 + \text{X} \longrightarrow \text{Y} \xrightarrow{\text{HCl}} \text{Z} + \text{Cl}_2 + \text{H}_2\text{O}$$
- (Odour less gas) (White insoluble compound) (Soluble compound)
- In the above reaction Y and Z are respectively
- (1) $\text{CaOCl}_2, \text{CaCl}_2$
 - (2) $\text{CaCO}_3, \text{Ca(HCO}_3)_2$
 - (3) $\text{CaSO}_3, \text{Ca(HSO}_3)_2$
 - (4) $\text{CaS}, \text{Ca(HS)}_2$

65. Observe the experimental setup carefully :



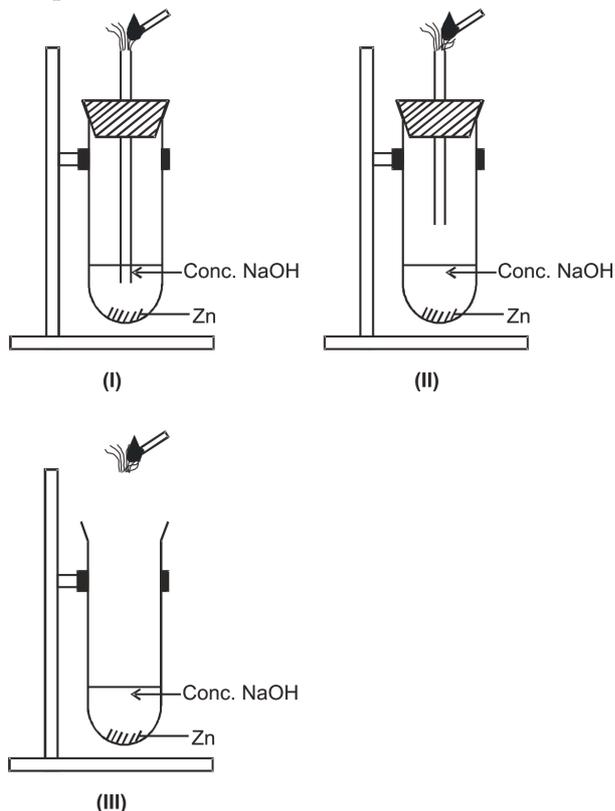
When NaOH reacts with Zn then H_2 gas is released. This gas burns with a blue flame and popping sound. Out of above techniques which one is correct :

- (1) Only II
- (2) Only III
- (3) Both (II) & (III)
- (4) Both (I) and (II)

66. Select the correct statement.

- (1) Dolomite is an ore of Zinc
- (2) Galena is an ore of Mercury
- (3) Pyrolusite is an ore of Iron
- (4) Cassiterite is an ore of Tin

67. Choose the correct sets which represent the oxides as Acidic : basic : neutral : amphoteric, respectively



(i) CO_2 : MgO : N_2O : NO

(ii) SO_2 : NO : CO : Al_2O_3

(iii) P_2O_5 : ZnO : NO : Al_2O_3

(iv) SO_3 : CaO : N_2O : PbO

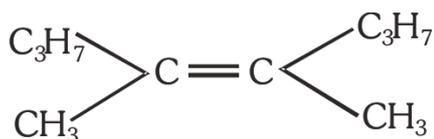
(1) i and ii

(2) ii and iii

(3) iii and iv

(4) i and iv

68. IUPAC name of the compound is



(1) 4, 5 – dimethyloct – 4 – ene

(2) 2, 3 – dipropylbut – 2 – ene

(3) 4 – methyl – 5 – propylhex – 4 – ene

(4) 2, 4 – dipropylpent – 2 – ene

69. Consider the following statements

(i) Element is always metal.

(ii) Both fog and clouds are liquid in gas type of colloids.

(iii) A colloidal solution is a homogeneous mixture.

Which of these statements(s) is/are incorrect?

(1) (i) and (ii)

(2) (ii) and (iii)

(3) (i) and (iii)

(4) Only (i)

70. If $Z = 10$ the valency of the element is

(1) zero

(2) one

(3) two

(4) three

71. Which is not correct among the following?
- (1) Thomson proposed that the nucleus of an atom contains protons and neutrons.
 - (2) Neutrons possess zero charge.
 - (3) Rutherford discovered nucleus of an atom.
 - (4) Proton possesses positive charge.
72. Ammonium nitrate on thermal decomposition produces
- (1) NH_3 and NO_2
 - (2) NH_3 and NO
 - (3) N_2O and H_2O
 - (4) N_2 and H_2O
73. Which is the correct order of basic nature?
- (1) $\text{Ba}(\text{OH})_2 < \text{Sr}(\text{OH})_2 < \text{Ca}(\text{OH})_2$
 - (2) $\text{Ba}(\text{OH})_2 > \text{Sr}(\text{OH})_2 > \text{Ca}(\text{OH})_2$
 - (3) $\text{Ba}(\text{OH})_2 > \text{Mg}(\text{OH})_2 > \text{Sr}(\text{OH})_2$
 - (4) $\text{Ba}(\text{OH})_2 < \text{Mg}(\text{OH})_2 > \text{Sr}(\text{OH})_2$
74. Ionic compound in general possess both
- (1) high melting points and non-directional bonds
 - (2) high melting points and low boiling points
 - (3) directional bonds and low boiling points
 - (4) high solubilities in polar and non-polar bonds
75. The most favourable conditions for ionic bonding are
- (1) low charge on ions, large cation, small anion
 - (2) low charge on ions, large cation, large anion
 - (3) high charge on ions, small cation, large anion
 - (4) high charge on ions, large cation, small anion
76. The molecular formulae of some organic compounds are given below, which of these compounds contains a Ketone group?
- (1) $\text{C}_3\text{H}_6\text{O}_2$
 - (2) $\text{C}_3\text{H}_6\text{O}$
 - (3) $\text{C}_3\text{H}_4\text{O}$
 - (4) $\text{C}_3\text{H}_8\text{O}$
77. Oxidation number of Nitrogen in NH_4NO_3 is
- (1) +3 and +5
 - (2) -3 and +5
 - (3) +3 and -3
 - (4) +1 and +3
78. How many grams of NaOH must be dissolved in 1 litre of the solution to give it a pH value of 12?
- (1) 0.20 g
 - (2) 0.40 g
 - (3) 0.10 g
 - (4) 1.3 g

79. Consider following as a portion of the periodic table from Group No. 13 to 17. Which of the following statements is/are true about the elements shown in it?

			V	Z
W				Y
X				

- (I) V, W, Y and Z are less electropositive than X.
 (II) V, W, X and Y are more electronegative than Z.
 (III) Atomic size of Y is greater than that of W.
 (IV) Atomic size of W is smaller than that of X.
- (1) I, II and III (2) II and III (3) I and IV (4) III and IV
80. Identify true and false statements.
- (i) All the decomposition reactions are analysis reactions also.
 (ii) All the addition reactions are not synthesis reactions.
 (iii) All analysis reactions are addition reactions also.
- (1) FTT (2) TFT (3) FTF (4) FFT
81. If 11 gms of NaCl is dissolved in 99 gms of water, the concentration (mass %) of the solution formed is
- (1) 11.1% (2) 10% (3) 88.9% (4) 10.10%
82. Mass of one atom of the element X is 1.66×10^{-24} g. Number of atoms in 1 g of the element is
- (1) 1.66×10^{-24} (2) 1.66×10^{24}
 (3) $1.66 \times 10^{-24} \times N_A$ (4) 6.02×10^{23}
83. Rutherford's experiment, which established the nuclear model of the atom, used a beam of
- (1) β particles, which impinged on a metal foil and got scattered
 (2) γ -rays, which impinged on a metal foil and ejected electrons
 (3) Helium atoms, which impinged on a metal foil and got scattered
 (4) Helium nuclei, which impinged on a metal foil and got scattered
84. In the redox reaction :
 $2A^- + B_2 \longrightarrow 2B^- + A_2$, which of the following statements is not correct?
- (1) B_2 is the oxidising agent. (2) A^- is the reducing agent.
 (3) B_2 has gained one electron. (4) Both (1) and (2)
85. NaOH(aq), HCl(aq) and NaCl(aq) concentration of each is 10^{-3} M. Their pH will be respectively
- (1) 11, 3, 3 (2) 11, 3, 11 (3) 11, 3, 7 (4) 3, 3, 7

86. A part of the modern periodic table is presented below in which the alphabets represent the symbols of elements.

Table

Group →	1	2	14	15	16	17
Period ↓						
2				M	Q	
3	A	J			R	
4	E		L			T
5	G					X

Consult the above part of the periodic table to predict which of the following is a covalent compound

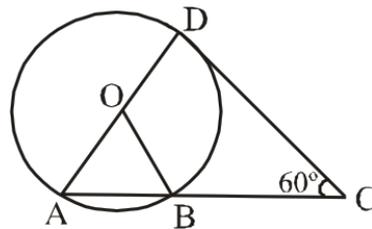
- (1) AT (2) JQ (3) JX₂ (4) RQ₂
87. Arun needs 1.71 g of cane sugar (C₁₂H₂₂O₁₁) to sweeten his tea. What would be the number of carbon atoms consumed through sugar in the tea?
- (1) 3.66×10^{22} (2) 7.2×10^{21} (3) 5×10^{21} (4) 6.6×10^{22}
88. A compound X on heating produces a colourless gas 'Y' and metal oxide Z. The metal oxide is yellow when hot and show white colour when it is cooled. Identify X, Y and Z.
- (1) X = ZnCO₃, Y = CO₂, Z = ZnO (2) X = CaCO₃, Y = CO₂, Z = CaO
- (3) X = AgNO₃, Y = NO₂, Z = AgO (4) X = CuSO₄, Y = SO₂, Z = CuO
89. Which of the following solutions has the same concentration of H⁺ ions as 0.1 N HCl?
- (1) 0.1 N H₂SO₄ (2) 0.3 N H₃PO₄ (3) 0.2 N HNO₃ (4) 0.2 N H₃PO₃
90. Antimony and arsenic belong to the category of
- (1) metals (2) metalloids (3) non-metals (4) minerals

MATHEMATICS

This section contains **30 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

91. 30th term of the A.P. 10, 7, 4, is :
- (1) 97 (2) 77 (3) -77 (4) -87
92. If $\alpha + \beta = \frac{\pi}{2}$ and $\sin \alpha = \frac{1}{3}$, then $\sin \beta$ is :
- (1) $\frac{\sqrt{2}}{3}$ (2) $\frac{2\sqrt{2}}{3}$ (3) $\frac{2}{3}$ (4) $\frac{3}{4}$
93. A cylindrical rod whose height is 8 times of its radius is melted and recast into spherical balls of same radius. The number of balls will be :
- (1) 4 (2) 3 (3) 6 (4) 8
94. The solution of $2x + 3y = 2$ and $3x + 2y = 2$ can be represented by a point in the co-ordinate planes in :
- (1) First quadrant (2) Second quadrant
(3) Third quadrant (4) Fourth quadrant
95. Find one root of the given quadratic equation $(1 - b)x^2 + (2 - c)x + (3 - a) = 0$, if $a + b + c = 6$:
- (1) 0 (2) 1 (3) -1 (4) 2
96. In an examination, 10 students scored the following marks in Mathematics 35, 19, 28, 32, 63, 02, 47, 31, 13, 98. Its range is :
- (1) 2 (2) 96 (3) 98 (4) 50
97. Given two different prime numbers P and Q, find the number of divisors of P^3Q^2 :
- (1) 8 (2) 4 (3) 6 (4) 12
98. The difference between the semi-perimeter and the sides of a ΔABC are 8 cm, 7 cm & 5 cm respectively. The area of triangle is :
- (1) $20\sqrt{7} \text{ cm}^2$ (2) $10\sqrt{14} \text{ cm}^2$ (3) $20\sqrt{14} \text{ cm}^2$ (4) 140 cm^2
99. The remainder when $x^6 - 3x^5 + 2x^2 + 8$ is divided by $x + 1$ is :
- (1) 24 (2) 14 (3) 8 (4) 18
100. $DE \parallel BC$, where ABC is a triangle. If $AB = 5 BD$ and $EC = 1.6 \text{ cm}$. then $AE =$
- (1) 6 cm (2) 6.2 cm (3) 6.4 cm (4) 6.6 cm
101. Two non intersecting circles, one lying inside the other are of radii x and y ($x > y$). If the minimum distance between circumferences is z , the distance between their centres is :
- (1) $x - y + z$ (2) $x - y - z$ (3) $x + y - z$ (4) $x - y$
102. If the distance between the points $(x, -1)$ and $(3, 2)$ is 5, then the value of x is :
- (1) 2 (2) -2 (3) -1 (4) 1

103. The angles of a quadrilateral are in A.P. whose common difference is 10. Then the angles are :
- (1) 70, 80, 90, 100 (2) 65, 75, 85, 95 (3) 60, 70, 80, 90 (4) 75, 85, 95, 105
104. Evaluate $\tan 20^\circ \tan 32^\circ \tan 45^\circ \tan 58^\circ \tan 70^\circ$:
- (1) 0 (2) -1 (3) 1 (4) 2
105. The edge of cube is 20 cm. Then the number of small cuboids of $5 \text{ cm} \times 5 \text{ cm} \times 10 \text{ cm}$ edges that can be formed from this cube are:
- (1) 4 (2) 32 (3) 64 (4) 100
106. Sum of two numbers is 35 and their difference is 13. The number are :
- (1) 24, 11 (2) 15, 28 (3) 8, 21 (4) 15, 21
107. If $a \neq b$ and difference between the roots of the equations $x^2 + ax + b = 0$ and $x^2 + bx + a = 0$ is the same, then :
- (1) $a + b + 4 = 0$ (2) $a + b - 4 = 0$ (3) $a - b + 4 = 0$ (4) $a - b - 4 = 0$
108. The median of the data 25, 34, 31, 23, 22, 26, 35, 29, 20, 32 is :
- (1) 27 (2) 26.5 (3) 28.5 (4) 27.5
109. If x and y are odd positive integers, then $x^2 + y^2$ is :
- (1) Odd (2) Even (3) Odd or Even (4) zero
110. A park in the shape of an quadrilateral ABCD has $AB = 9\text{m}$, $BC = 12 \text{ m}$, $CD = 5 \text{ m}$, $AD = 8 \text{ m}$ and $\angle C = 90^\circ$. Find the area of park. [Given $\sqrt{35} = 5.9$]
- (1) 65.4 m^2 (2) 65.2 m^2 (3) 68.4 m^2 (4) 64.4 m^2
111. If α and β are the zeros of the quadratic polynomial $f(x) = ax^2 + bx + c$, then evaluate $\frac{1}{a\alpha + b} + \frac{1}{a\beta + b}$.
- (1) $\frac{1}{abc}$ (2) $\frac{c}{ab}$ (3) $\frac{b}{ac}$ (4) $\frac{a}{bc}$
112. The corresponding altitudes of two similar triangles are 8 cm and 12 cm respectively, then the ratio of their areas is :
- (1) 2 : 3 (2) 4 : 9 (3) 3 : 8 (4) 9 : 4
113. In the figure, if O is the centre of the circle, then $\angle DOB$ equals :



- (1) 120° (2) 30° (3) 90° (4) 60°
114. If three points $(0, 0)$, $(3, \sqrt{3})$ and $(3, \lambda)$ form an equilateral triangle, then $\lambda =$:
- (1) 2 (2) -3 (3) -4 (4) $-\sqrt{3}$

115. If 7th and 13th terms of an A.P be 34 and 64 respectively, than its 18th term is :

- (1) 87 (2) 88 (3) 89 (4) 90

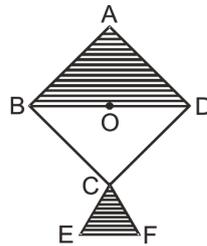
116. If $\sin 3A = \cos (A - 26^\circ)$ where $3A$ is an acute angle, find the value of A :

- (1) 28° (2) 26° (3) 30° (4) 29°

117. The equation $ax^2 + bx + c = 0$, $a \neq 0$ has no real roots, if :

- (1) $b^2 < 4ac$ (2) $b^2 > 4ac$ (3) $b^2 = 4ac$ (4) $b = 4ac$

118. A kite in the shape of a square with each diagonal 32 cm and having a tail in the shape of an isosceles triangle of base 8 cm and each side 6 cm, is made of three different shades as shown in the figure. How much paper of shaded region has been used in it ? (Given : $\sqrt{5} = 2.24$)



- (1) 273.92 cm^2 (2) 273.82 cm^2 (3) 273.83 cm^2 (4) 273.85 cm^2

119. Remainder when we divide $x^3 + 3x^2 - 5x + 4$ by $(x - 1)$ is :

- (1) 3 (2) -3 (3) 0 (4) 4

120. The areas of two similar triangles are 196 cm^2 and 169 cm^2 . If the median of first one is 4 cm, the other median is :

- (1) 7.31 cm (2) 1.73 cm (3) 3.71 cm (4) 1.37 cm

BIOLOGY

This section contains **30 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

121. The chlorophyll in photosynthesis is used for
- (1) Absorbing light (2) To form carbohydrate
(3) No utilization (4) Reduction of CO₂
122. More energy is produced in aerobic respiration than anaerobic respiration because in anaerobic respiration
- (1) Food is incompletely oxidized (2) Very few enzymes are involved
(3) Oxygen is not required (4) Alcohol is produced
123. A human heart is situated in a cavity slightly right to the sternum. This cavity or notch is __
- (1) Pulmonary cavity (2) Cardiac notch
(3) Buccal cavity (4) Nasal notch
124. The retroperitoneal kidney is:
- (1) Kidney of fish
(2) Kidney covered by peritoneum on ventral side
(3) Kidney covered by peritoneum on dorsal side
(4) Kidney uncovered by peritoneum on either side
125. Which among the following does not reproduce by spore formation:
- (1) Penicillium (2) Amoeba (3) Mucor (4) Rhizopus
126. What will be the number of chromosomes present in each gamete produced by the plants if the palisade cells of a species of plant contain 28 chromosomes in all?
- (1) 56 (2) 28 (3) 14 (4) 4
127. Which among the following statements is incorrect in view of the plants?
- (1) They convert the solar energy into mechanical energy
(2) They prepare their food from inorganic compounds
(3) They are also called producers
(4) They are the initial source of energy in a food chain
128. Tendon is made up of
- (1) Yellow fibrous connective tissue (2) Adipose tissue
(3) Modified white fibrous tissue (4) Areolar tissue
129. Which of the following is not a reason for the spread of cholera?
- (1) Breeding of the flies on the garbage heaps (2) Use of spices in food
(3) Drinking the contaminated water (4) Consuming the contaminated food

130. The number of chromosomes in both parents and offsprings of a particular species remains constant because:
- (1) Chromosomes get doubled after zygote formation
 - (2) Chromosomes get doubled after gamete formation
 - (3) Chromosomes get halved during gamete formation
 - (4) Chromosomes get halved after gamete formation
131. Function of large intestine is mainly
- (1) Absorption of water
 - (2) Assimilation of food
 - (3) Digestion of fats
 - (4) Digestion of carbohydrates
132. In human females, an event that mainly reflects end of reproductive phase is :
- (1) Growth of body
 - (2) change in voice
 - (3) changes in hair pattern
 - (4) stop the menstruation
133. A cross between a tall plant (TT) and short plant (tt) resulted in progeny that were all tall plants as:
- (1) Tallness is the dominant trait
 - (2) Shortness is the dominant trait
 - (3) Tallness is the recessive trait
 - (4) Height of plant is not governed by gene T or t
134. Lipase acts on
- (1) Amino acids
 - (2) Fats
 - (3) Carbohydrates
 - (4) Proteins
135. Incomplete oxidation of glucose into pyruvic acid with several intermediate steps is known as
- (1) TCA-pathway
 - (2) Glycolysis
 - (3) HMS-pathway
 - (4) Krebs cycle
136. The duration of one complete cycle of heart or cardiac cycle is:
- (1) 0.8(60/72) sec
 - (2) 1.0(60/60) sec
 - (3) 0.6(60/96) sec
 - (4) 0.5(60/120) sec
137. _____ are tubes made up of smooth muscle fibres that transport urine to the bladder from the kidneys
- (1) Renal Papilla
 - (2) Urethra
 - (3) Ureters
 - (4) Renal artery
138. Mark the INCORRECT statement about prostate gland?
- (1) Located inferior to the urinary bladder
 - (2) Secretion is thin and milky colored
 - (3) Secretion is acidic in nature
 - (4) Function is increasing the mobility of the sperm
139. Which of the following characters can be acquired but not inherited?
- (1) Colour of skin
 - (2) Size of body
 - (3) Colour of eyes
 - (4) Texture of hair

140. Which of the following may be a conclusion of the excessive exposure of humans to sun's ultraviolet rays?
 (i) Peptic ulcers
 (ii) Eye disease like cataract
 (iii) Damage to lungs
 (iv) Skin cancer
 (1) (i) and (iv) (2) (ii), (iii) and (iv) (3) (ii) and (iv) (4) Only (iv)
141. Epithelial tissue always has an exposed outer surface and an inner surface anchored to connective tissue by a thin, non-cellular structure called the
 (1) Nonstratified layer (2) Stratified layer
 (3) Basement membrane (4) Fibroblast
142. Which of the following is not a communicable disease?
 (1) Polio (2) Typhoid (3) Tuberculosis (4) Diabetes
143. Raw materials used in the autotrophic mode of nutrition is:
 (1) Glucose, Starch, Fructose (2) Protein, Fats
 (3) Carbon dioxide, water (4) Hydrogen, Oxygen
144. Oxidative phosphorylation is production of
 (1) ATP in photosynthesis (2) NADPH in photosynthesis
 (3) ATP in respiration (4) NADH in respiration
145. With rise in turgidity, wall pressure will
 (1) Remain Unchanged (2) Decrease
 (3) Fluctuate (4) Increase
146. The triploid structure formed after double fertilization is called _____.
 (1) fruit (2) seed (3) zygote (4) endosperm
147. Mendel used the term "_____" to show the law of dominance in peas, which we call now genes.
 (1) seed (2) factor (3) element (4) Thing
148. What will happen if all the deer are killed in the given food chain?
 Grass → Deer → Lion
 (1) The population of grass decreases.
 (2) The population of lions increases.
 (3) The population of lions remains unchanged.
 (4) The population of lions decreases and grass increases.
149. Microvilli of epithelial cells
 (1) Increase surface area (2) Protect the cells
 (3) Engulf the foreign matter (4) Give movements to the cells
150. Microbes which enter the body through nose most likely affect
 (1) Liver (2) Heart (3) Brain (4) Lungs

