VISTO-2015 - 16

(VELAMMAL INTER SCHOOL SCIENCE TALENT OLYMPIAD)

SEASON – II

CLASS - IX

Duration: 2hrs. **Max. Marks: 100**

INSTRUCTIONS TO THE CANDIDATE

1. a) Write your **NAME** and **CLASS** in the space provided on **OMR** Response sheet.

   b) You have to mark the answers on the **OMR** Response sheet only.

   c) You have to handle the **OMR** Response sheet with utmost care.

   d) Do not fold/mutilate or make any unnecessary markings on the **OMR** Response sheet.

   e) Use **BLUE** or **BLACK BALL POINT PEN** only to darken the appropriate circles in **OMR** Response sheet.

2. Answers marked with **PENCIL** will not be considered for evaluation.

3. This Question Paper consists of **100 QUESTIONS**, under four subject heads, **MATHEMATICS (40 Questions), PHYSICS (20 Questions), CHEMISTRY (20 Questions) and BIOLOGY (20 Questions).**

4. Each question has four alternative responses marked a, b, c, d. You have to darken the appropriate circle provided in the OMR Response sheet against each question.

5. **1 MARK** will be awarded for every correct response for all the questions in **ALL THE FOUR SUBJECTS.**

6. **NO** mark will be deducted for incorrect response.

7. Usage of Calculators, Log tables and Electronic gadgets is strictly prohibited in the examination hall.

8. Return the OMR Response sheet to the Invigilator at the end of Examination, before leaving the examination hall.

**** * * All the best * * ****

MATHEMATICS

1. Which of the following statements is true?

   a) The graph of the equation $2y-5=0$ is parallel to y-axis

   b) $y=3x+5$ has a unique solution

   c) The equation of the x-axis is y = 0

   d) The graph of every linear equation in two variables is a curve

2. Two planes start from a city and fly in opposite directions, one averaging a speed of 40 kmph greater than the second. If they are 3400 km apart from each other in 5 hours, the sum of their average speeds, is .....

   a) 680 kmph b) 360 kmph c) 320 kmph d) 640 kmph

3. **Statement I :** If the angles of a pentagon are in the ratio 2 : 3 : 3 : 3 : 4, then the least angle of the pentagon is 72^o.

   Statement II : If a and b are real numbers, then the equation $3x-5+a=bx+1$ has a unique solution for all values of a and b.

   a) Both statements I & II are correct

   b) Both statements I & II are incorrect

   c) Statement I is correct and statement II is incorrect

   d) Statement I is incorrect and statement II is correct

4. The diagonals AC and BD of a parallelogram ABCD intersect each other at O. Let PQ be a line through O which meets BC at P and AD at Q.

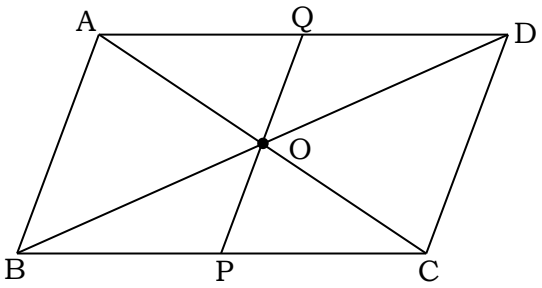
   If area of quadrilateral ABPQ = k {area of parallelogram ABCD}, then k = ...

   a) $\frac{1}{2}$

   b) 4

   c) 2

   d) $\frac{1}{4}$



5. **Statement I :** Let m be the number of distinct (non congruent) integer sided triangles each with perimeter 15 and n be the number of distinct (non congruent) integer sided triangles each with perimeter 16, then (m-n) = 2.

   Statement II : The adjacent sides of a parallelogram are 15 cm and 10 cm. If length of one diagonal of this parallelogram is 20 cm, then the length of the other diagonal will be $5\sqrt{10}$ cm.

   a) Both statements I & II are correct

   b) Both statements I & II are incorrect

   c) Statement I is correct and statement II is incorrect

   d) Statement I is incorrect and statement II is correct

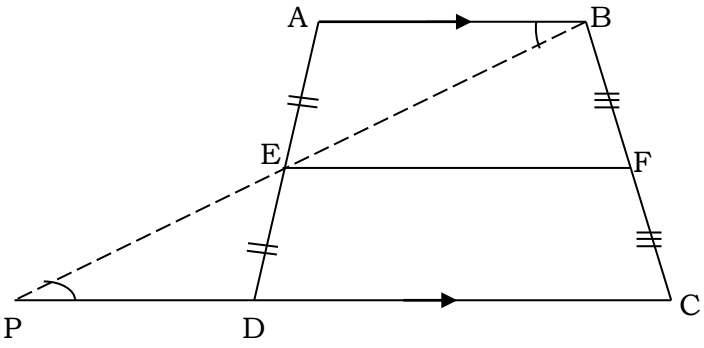
6. In the adjacent figure, E and F are respectively, the mid-points of non-parallel sides of a trapezium ABCD. The length of EF is equal to .....

a) $\frac{1}{2}PB$

b) $\frac{1}{2}(AB+CD)$

c) $\frac{1}{2}CD$

d) $\frac{1}{2}(AE+BF)$



7. In a group of 500 people, 200 can speak Hindi alone while only 125 can speak English alone. The number of people who can speak both Hindi and English is .....

a) 175 b) 325 c) 300 d) 375

8. If n(A) = 115, n(B) = 326 and n(A – B) = 47 then $n(A\cup B)$ is equal to .....

a) 373 b) 370 c) 165 d) 175

9. **Statement I :** For any two sets A and B (i) $(A\cup B)^1 = A^1\cap B^1$ and (ii) $(A\cap B)^1 = A^1\cup B^1$ are known as De-Morgan's laws.

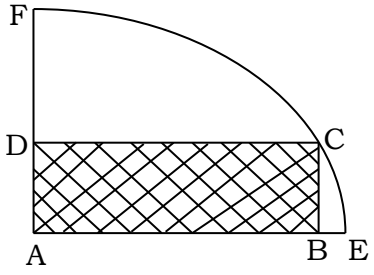
Statement II : If A is a void set then $n[P(P(P(A)))]=0$; where P(A) represents powerset of set A and n(X) represents cardinality (i.e., number of elements present in the set) of set X.

a) Both statements I & II are correct b) Both statements I & II are incorrect

c) Statement I is correct and statement II is incorrect

d) Statement I is incorrect and statement II is correct

10. In the adjacent figure, ABCD is a rectangle inscribed in a quadrant of a circle of radius 10 cm. If $AD = 2\sqrt{5}$ cm, then the area of the rectangle ABCD is .....



a) $30\,\text{cm}^2$ b) $35\,\text{cm}^2$

c) $40\,\text{cm}^2$ d) $50\,\text{cm}^2$

11. A triangle and a trapezoid are equal in area. They also have the same altitude. If the base of the triangle is 18 inches, the mean of the parallel sides of the trapezoid is .....

a) 18 inches b) 9 inches c) 36 inches d) can't be determined

12. **Statement I :** If two triangles are equiangular then the ratio of the corresponding sides is same as the ratio of the corresponding medians.

Statement II : Let AD, BE and CF be medians of a ΔABC, then

$$2(AD + BE + CF) < 3(AB + BC + CA) < 4(AD + BE + CF)$$

a) Both statements I & II are correct b) Both statements I & II are incorrect

c) Statement I is correct and statement II is incorrect

d) Statement I is incorrect and statement II is correct

13. **Assertion (A) :** In triangle ABC, the altitude A to BC meets BC at D, and the altitude from B to CA meets AD at H. If AD = 4 cm, BD = 3 cm and CD = 2 cm and if $\frac{AB}{BD} = \frac{AH}{HD}$, then the length of HD is $\frac{3}{2}$ cm.

Reason (R) : In ΔABC, if AD divides BC in the ratio m : n, then the area of ΔABD : area of ΔADC, is m : n.

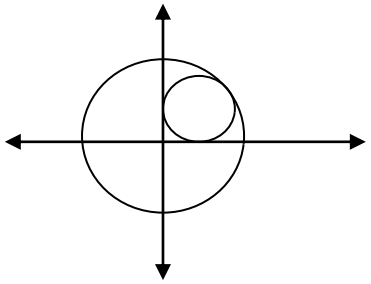
a) Both Assertion and Reason are true and the Reason is the correct explanation of the Assertion

b) Both Assertion and Reason are true but Reason is not the correct explanation of the Assertion

c) Assertion is true but Reason is false

d) Assertion is false but Reason is true

14. In the adjacent figure, the lager circle has radius 1 unit. Then the radius of the smaller circle must be ..... units.



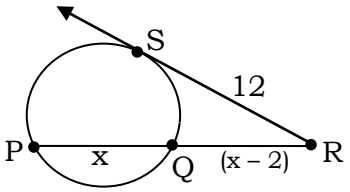
a) $\frac{1}{\sqrt{2}-1}$

b) $\frac{1}{2}$

c) $\frac{1}{\sqrt{2}}$

d) $\frac{1}{\sqrt{2}+1}$

15. Let PQ be a chord of a circle. The tangent SR at S on the circle cuts PQ produced at R. If SR = 12 cm, PQ = x cm, QR = (x – 2) cm, then x in cm, is .....



a) 6

b) 7

c) 10

d) 14

16. **Statement I :** The Quadrilateral formed by angle bisectors of a cyclic quadrilateral is also cyclic.

Statement II : The area of a rhombus OABC, whose three vertices A, B and C lie on a circle with centre O, is $5\sqrt{3}$ sq cm, then the radius of the circle is 10 cm.

a) Both statements I & II are correct

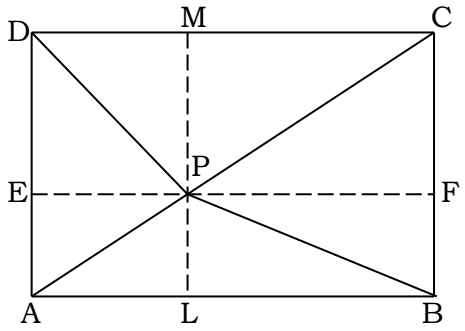
b) Both statements I & II are incorrect

c) Statement I is correct and statement II is incorrect

d) Statement I is incorrect and statement II is correct

Read the following paragraph and answer the questions 17 and 18 :

In the adjacent figure, P is a point in the interior of a rectangle ABCD.(Note: ar = area)



17. ar (ΔAPD) + ar (ΔPBC) = ...

a) ar (ΔAPB) + 2ar (ΔBPF)
b) ar (ΔPCD) + 2ar (ΔCPF)
c) ar (ΔAPB) + ar (ΔPCD)
d) ar (ΔPCD) + ar (ΔABC)

18. ar (rectangle ABCD) = ...

a) ar (ΔAPB) + 3ar (ΔAPD)
b) 2ar (ΔAPD) + 2ar (ΔBPC)
c) 2ar (ΔPCD) + ar (ΔAPB)
d) 4ar (ΔBPF) + 4ar (ΔPED)

19. **Statement I :** The construction of a triangle ABC in which AB = 4 cm, $\angle A = 60^o$ is not possible when difference between BC and CA is 3.5 cm.

Statement II : With the help of a ruler and compass it is possible to construct an angle of 37.5^o.

a) Both statements I & II are correct
b) Both statements I & II are incorrect
c) Statement I is correct and statement II is incorrect
d) Statement I is incorrect and statement II is correct

20. **Statement I:** ΔXYZ can be constructed with the following measurements:

$\angle Y = 30^0, \angle Z = 90^0$ and XY + YZ + ZX = 11cm

Statement II: ΔPQR can be constructed with the following measurements:

QR = 7cm, $\angle Q = 75^0$ and PQ + PR = 13cm

a) Both statements I & II are correct
b) Both statements I & II are incorrect
c) Statement I is correct and statement II is incorrect
d) Statement I is incorrect and statement II is correct

21. Match the following :

	Column – I **To construct a...**		**Column – II** **the minimum number of required measurements is...**
(i)	Parallelogram	p)	1
(ii)	Rhombus	q)	2
(iii)	Quadrilateral	r)	3
(iv)	Trapezium	s)	4
(v)	Square	t)	5

a) (i) q, (ii) s, (iii) t, (iv) r, (v) p
b) (i) r, (ii) q, (iii) t, (iv) s, (v) p
c) (i) s, (ii) q, (iii) r, (iv) t, (v) p
d) (i) t, (ii) s, (iii) r, (iv) q, (v) p

22. If $x = r\sin\theta.\cos\phi,\ y = r\sin\theta.\sin\phi$ and $z = r\cos\theta$, then the relation among x, y, z and r is .....

a) $x^2 + y^2 - z^2 = r^2$ b) $x^2 - y^2 + z^2 = r^2$

c) $y^2 + z^2 - x^2 = r^2$ d) $x^2 + y^2 + z^2 = r^2$

23. If $3\cot\theta = 5$, then value of $\frac{5\sin\theta - 3\cos\theta}{5\sin\theta + 3\cos\theta}$ is .....

a) -1 b) $\frac{5}{3}$ c) 0 d) $\frac{3}{5}$

24. **Statement I :** If $2(\cos\theta + \sec\theta) = 5$, then the value of $\cos^2\theta + \sec^2\theta$ is $\frac{17}{4}$

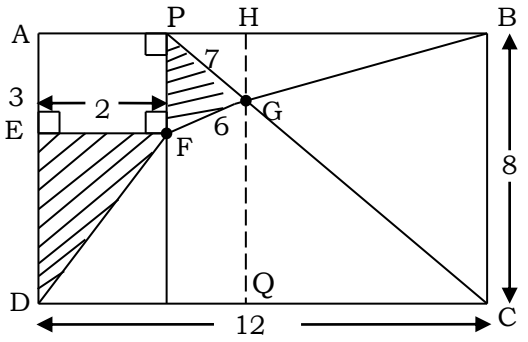
Statement II : The value of θ for which $\sqrt{3}\tan 2\theta - 3 = 0$, is 30^o.

a) Both statements I & II are correct b) Both statements I & II are incorrect

c) Statement I is correct and statement II is incorrect

d) Statement I is incorrect and statement II is correct

25. Let ABCD be a rectangle, the area of the shaded portion in the adjacent figure is .....sq. units.



a) $(6\sqrt{2} + 9)$

b) $(5 + 9\sqrt{2})$

c) $(3 + \sqrt{2})$

d) $(5 + 4\sqrt{5})$

26. **Statement I :** If l is the length of a diagonal of a cube of volume V, then the relation between l and V, is $l^3 = \sqrt{3}V$.

Statement II : If A_1, A_2 and A_3 denote the areas of three adjacent faces of a cuboid, then its volume is given by $V = \sqrt[3]{A_1.A_2.A_3}$.

a) Both statements I & II are correct

b) Both statements I & II are incorrect

c) Statement I is correct and statement II is incorrect

d) Statement I is incorrect and statement II is correct

27. Water flows at the rate of 102.4 m per minute through a cylindrical pipe having its diameter as 5 mm. The time taken to fill a conical vessel whose diameter of the base is 40 cm and depth 24 cm, is ..... approximately.

a) 50 min b) 51 min c) 54 min d) 55 min

28. The average of n-numbers $x_1, x_2, x_3, \ldots x_n$ is A. If x_1 is replaced by $(x + a)x_1$, x_2 is replaced by $(x + a)x_2, \ldots, x_n$ is replaced by $(x + a)x_n$; then the new average is .....

a) $\frac{(n+1)A + x_n}{n}$ b) $\frac{(n-1)A + nx_n}{n}$ c) $\frac{nA + (n+1)x_n}{n}$ d) $(x + a)A$

29. The relative humidity (in %) of a city for 10 days is given in the following box :

92.1	97.1	95.7	93.3	89
96.2	94.9	97.3	92.1	98.3

The range of the above data is .....

a) 9.3 b) 9.5 c) 9.6 d) 9.8

30. **Statement I :** If E_1, E_2, E_3,....,E_{N-1}, E_N are the N elementary events associated to a random experiment then $P(E_1) + P(E_2)+....+P(E_{N-1}) + P(E_N) = 1$.

Statement II : In $(x^2 - y^2)$ trials of a random experiment, if an event E happens (x – y) times then the probability of happening of event $\overline{E}$ is $\frac{1}{x-y}$.

a) Both statements I & II are correct

b) Both statements I & II are incorrect

c) Statement I is correct and statement II is incorrect

d) Statement I is incorrect and statement II is correct

31. A die is rolled 100 times and the data is recorded as given in the table.

Outcomes	1	2	3	4	5	6
Frequency	22	13	20	10	25	10

The probability of getting a prime number, is .....

a) $\frac{67}{100}$ b) $\frac{58}{100}$ c) $\frac{45}{100}$ d) $\frac{71}{100}$

32. The mean of 13 observations is 14. If the mean of the first 7 observations is 12 and that of the last 7 observations is 16, then the 7^{th} observation is .....

a) 18 b) 16 c) 14 d) 12

Read the following paragraph and answer the questions 33 and 34 :

A box contains 100 balls bearing numbers 1, 2, 3, ...,100. A ball is drawn at random from the box. The probability that the number on the ball is;

33. Divisible by 2 or 3 is .....

a) $\frac{83}{100}$ b) $\frac{17}{100}$ c) $\frac{33}{100}$ d) $\frac{67}{100}$

34. Either a prime or a composite number, is .....

a) $\frac{1}{100}$ b) $\frac{76}{100}$ c) $\frac{99}{100}$ d) 1

Read the following paragraph and answer the questions 35 and 36 :

Mr. Santhosh is going on a long journey for 16 hours; starting at 5.00 hrs by his car. The speed of the car at different hours is given below :

Time (in hours)	5	7	9	11	13	15	17	19	21
Speed (in km/hour)	40	50	60	80	70	75	65	60	50

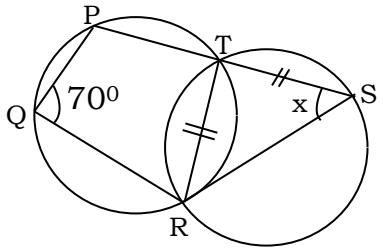
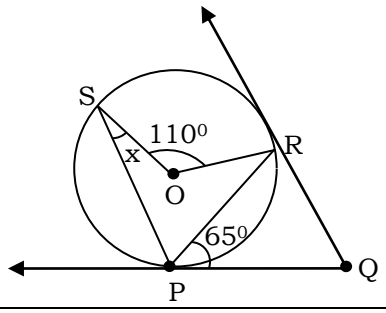
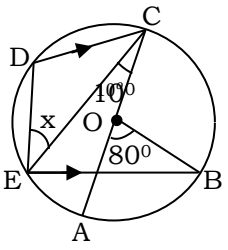
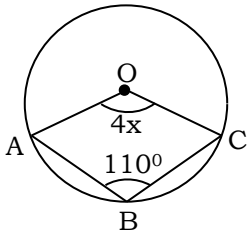
35. The percentage of decrease in speed during 19.00 hrs and 21.00 hrs. is .....

a) $16\frac{1}{3}\%$ b) $16\frac{2}{3}\%$ c) $17\frac{2}{3}\%$ d) $18\frac{2}{3}\%$

36. The average speed (in kmph) of the car among 5.00 hrs, 7.00 hrs and 9.00 hrs, is .....

a) 50 b) 55 c) 60 d) 65

Match the following :

	Column – I (Figure)		**Column – II (Value of x)**
37.		(a)	70^o
38.		(b)	55^o
39.		(c)	35^o
40.		(d)	30^o

PHYSICS

41. A body of mass m kg is lifted by a man to a height of one metre in 30 sec. Another man lifts the same mass to the same height in 60 sec. The work done by them are in the ratio

a) 1 : 2 b) 1 : 1 c) 2 : 1 d) 4 : 1

42. A bullet of mass 0.05 kg moving with a speed of $80\,ms^{-1}$ enters a wooden block and is stopped after a distance of 0.40 m. The average resistive force exerted by the block on the bullet is

a) 300 N b) 20 N c) 400 N d) 40 N

43. Two bodies with kinetic energies in the ratio of 4 : 1 are moving with equal linear momentum. The ratio of their masses is

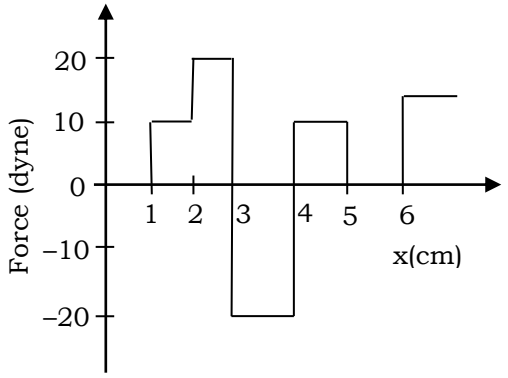
a) 1 : 2 b) 1 : 1 c) 4 : 1 d) 1 : 4

44. If momentum is increased by 20%, then kinetic energy increases by

a) 48% b) 44% c) 40% d) 36%

45. The relationship between force and position is shown in the figure given (in one dimensional case). The work done by the force in displacing a body from x = 1 cm to x = 5 cm is

a) 20 ergs
b) 60 ergs
c) 70 ergs
d) 700 ergs



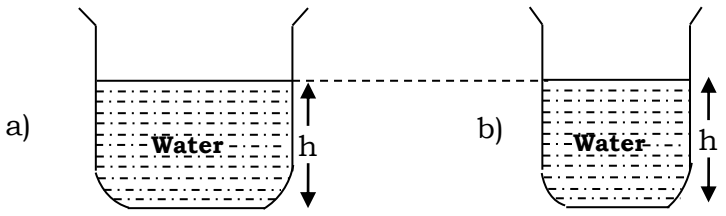
46. Atmospheric pressure is

a) 76cm of mercury b) 106cm of mercury
c) 26 cm of mercury d) 46cm of mercury

47. When a large bubble rises from the bottom of a lake to the surface, its radius gets doubled. If atmospheric pressure is equal to that of column of water height H, then the depth of lake is

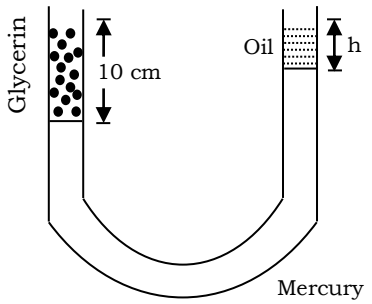
a) H b) 2H c) 7H d) 8H

48. From the adjacent figure, the correct observation is



a) The pressure on the bottom of tank (a) is greater than at the bottom of (b)
b) The pressure on the bottom of the tank (a) is smaller than at the bottom of (b)
c) The pressure depends on the shape of the container
d) The pressure on the bottom of (a) and (b) is the same

49. A vertical U-tube of uniform inner cross section contains mercury in both sides of its arms. A glycerin (density = $1.3\,g/cm^3$) column of length 10 cm is introduced into one of its arms. Oil of density $0.8\,gm/cm^3$ is poured into the other arm until the upper surfaces of the oil and glycerin are in the same horizontal level. Find the length of the oil column, Density of mercury = $13.6\,g/cm^3$.



a) 10.4 cm
b) 8.2 cm
c) 7.2 cm
d) 9.6 cm

50. **Assertion :** Hydrostatic pressure at any plant is proportional to height, density and acceleration due to gravity.

Reason : Pressure is force divided by area.

a) If both assertion and reason are true and the reason is the correct explanation of the assertion

b) If both assertion and reason are true but reason is not the correct explanation of the assertion

c) If assertion is true but reason is false

d) If the assertion and reason both are false

51. The frequency of a tuning fork is 384 Hz and velocity of sound in air is 352 m/s. How far the sound has traversed while fork completes 36 vibrations.

a) 3m b) 13m c) 23m d) 33m

52. The temperature at which the speed of sound in air becomes double of its value at 0^oC is

a) 273 K b) 546 K c) 1092 K d) 0K

53. A source of sound of frequency 600 Hz is placed inside water. The speed of sound in water is 1500 m/s and in air is 300 m/s. The frequency of sound recorded by an observer who is standing in air is

a) 200 Hz b) 3000 Hz c) 120 Hz d) 600 Hz

54. **Assertion :** The change in air pressure effects the speed of sound at constant temperature.

Reason : The speed of sound in gases is proportional to the square of pressure.

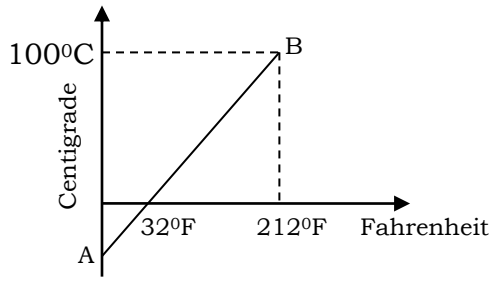
a) If both assertion and reason are true and the reason is the correct explanation of the assertion

b) If both assertion and reason are true but reason is not the correct explanation of the assertion

c) If assertion is true but reason is false

d) If the assertion and reason both are false

55. The graph AB shown in figure is a plot of temperature of a body in degree Celsius and degree Fahrenheit. Then



a) Slope of line AB is 9/5

b) Slope of line AB is 5/9

c) Slope of line AB is 1/9

d) Slope of line AB is 3/9

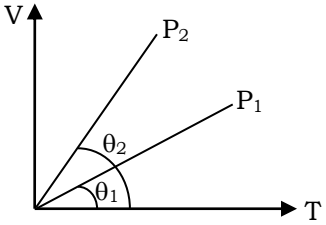
56. The pressure is P, volume V and temperature T of a gas in the jar A and the other gas in the jar B is at pressure 2P, volume V/4 and temperature 2T, then the ratio of the number of molecules in the jar A and B will be

a) 1 : 1 b) 1 : 2 c) 2 : 1 d) 4 : 1

57. A gas is filled in a cylinder, its temperature is increased by 20% on Kelvin scale and volume is reduced by 10%. How much percentage of the gas will leak out

a) 30% b) 40% c) 15% d) 25%

58. The figure shows the volume V versus temperature T graphs for a certain mass of a perfect gas at two constant pressures of P_1 and P_2. What inference can you draw from the graphs.



a) $P_1 > P_2$

b) $P_1 < P_2$

c) $P_1 = P_2$

d) no inference can be drawn due to insufficient information

59. **Assertion :** Equal masses of helium and oxygen gases are given equal quantities of heat. There will be a greater rise in the temperature of helium compared to that of oxygen.

Reason : The molecular weight of oxygen is more than the molecular weight of helium.

a) If both assertion and reason are true and the reason is the correct explanation of the assertion

b) If both assertion and reason are true but reason is not the correct explanation of the assertion

c) If assertion is true but reason is false

d) If the assertion and reason both are false

60. A closed vessel contains 8g of oxygen and 7g of nitrogen. The total pressure is 10 atm at a given temperature. If now oxygen is absorbed by introducing a suitable absorbent the pressure of the remaining gas in atm will be

a) 2 b) 10 c) 4 d) 5

61. The atomic numbers of two elements X and Y are 31 and 33 respectively. The formula of the most probable compound formed between X and Y is

a) XY_2 b) X_2Y c) XY d) X_3Y_2

62. A metal 'M' belongs to 2^{nd} group of the periodic table. The molar mass of its sulphate is 136. Then the molar mass of its phosphate is

a) 310 b) 135 c) 215 d) 365

63. Which of the following weighs more at STP?

a) 896 lit of CO b) 6.023×10^{25} atoms of sodium

c) 3.0115×10^{24} molecules of glucose d) 28 mole of chlorine monoxide

[atomic weights : C = 12; O = 16; Na = 23; H = 1; Cl = 35.5]

64. 8.4 g of sodium bicarbonate is heated strongly where 'x' g of sodium carbonate and 'y' g of carbondioxide are liberated. The obtained sodium carbonate is treated with excess dilute HCl where 'z' g of carbon dioxide is liberated. Then the total weight of carbondioxide formed in this total process is

a) 8.8 g b) 4.4 g c) 6.6 g d) 3.3 g

65. 20g of calcium carbonate [Molar mass = 100] is taken. Then which of the following is a correct statement?

I) It contains 0.3 mole of oxygen molecules.

II) It contains 0.2 g atom of carbon.

III) It contains 6.023×10^{23} atoms of all elements.

IV) It contains 3.6138×10^{23} atoms of oxygen.

a) only i, ii and iii are correct b) only i, ii and iv are correct

c) only ii, iii and iv are correct d) all i, ii, iii and iv are correct

66. The formula of a metal chloride is MCl_2. Its sulphite formula is

a) $M(SO_3)_2$ b) MSO_3 c) M_2SO_3 d) $M_2(SO_3)_3$

67. 3.0115×10^{22} atoms of an element has the weight of 1.35 g. Its nitrate molar mass is 213. Then the valency of the given element is

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

68. At certain temperature the hydrated salt of $MgSO_4$ exists as $MgSO_4.\ xH_2O$. On strong heating it loses its water of crystallization and becomes anhydrous $MgSO_4$. If 6.15g of the hydrated salt on heating gives 3g of anhydrous salt then the value of 'x' is [Atomic weights: Mg = 24; S = 32; O = 16; H = 1]

a) 5 b) 7 c) 10 d) 8

69. If the molar mass of a metal sulphate is 206 and the valency of the metal is 1, then the weight of 0.8 g atom of the metal is

a) 44 b) 55 c) 66 d) 88

70. An element has three stable isotopes with mass numbers A, A + 1 and A + 2. The atomic mass of A is observed as A + 1.2. Then the relative ratio of abundance of these three isotopes respectively is

a) 1 : 2 : 3 b) 1 : 3 : 2 c) 1 : 2 : 2 d) 2 : 3 : 4

71. The angular momentum of the electron revolving in an orbit of H-atom is $\frac{1.5(h)}{\pi}$. Then which of the following is wrong?

a) radius of the orbit is $4.761A^o$

b) total energy of the electron in that orbit is -1.511 eV

c) potential energy of the electron in that orbit is -0.7555 eV

d) kinetic energy of the electron revolving in that orbit is +1.511 eV

72. **Assertion (A) :** Bohr's model could able to calculate the IP_3 of lithium but could not calculate the IP_1 and IP_2 values of lithium.

Reason (R) : Bohr's model is applicable to single electron containing species like He^+ only

a) Both 'A' and 'R' are true and 'R' is the correct explanation of 'A'

b) Both 'A' and 'R' are true and 'R' is not the correct explanation of 'A'

c) 'A' is true and 'R' is false d) 'A' is false and 'R' is true

73. Regarding Mn^{2+} ion, which of the following is a correct statement?

i) M-shell contains 11 electrons

ii) Number of electrons with spin quantum number, m_s = -1/2 and azimuthal quantum number, l = 1 is 6

iii) The number of electrons with magnetic quantum number, m = +1 is 5

iv) The number of electrons present in s-orbitals is 6

a) All are correct statements b) Only i, iii and iv are correct

c) Only ii and iii are correct d) Only ii, iii and iv are correct

74. The correct matching for the following is

	List – I		**List – II**
A)	Number of p-electrons in phosphorus atom	P)	8
B)	Number of s-electrons in Mg atom	Q)	9
C)	Number of d-electrons in Zn^{2+} ion	R)	6
D)	Number of electrons in L-shell of Al^{3+} ion	S)	10

a) A → Q, B → R, C → S, D → P b) A → Q, B → R, C → P, D → P

c) A → R, B → R, C → S, D → P d) A → R, B → P, C → S, D → Q

75. Which of the following is not correctly given?

a) $_{14}Si^{30}$, $_{16}S^{32}$ → Isotones b) $_8O^{17}$, $_6C^{13}$ → Isodiaphers

c) $_2He^3$, $_2He^4$ → Isotopes d) $_7N^{17}$, $_9F^{19}$ → Isobars

76. The magnetic moment of Fe^{x+} ion is 4.9 BM. Then the value of 'x' is

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

77. The velocity of the electron revolving in 2nd orbit of H-atom is x cm/sec. Then the velocity of the electron revolving in 3rd orbit of He^{+} ion is .....cm/sec.

a) 16/9 (x) b) 6x c) 4/3 (x) d) 4/9 (x)

78. Which of the following is not a whole number?

a) Mass number b) Atomic number c) Atomic mass d) Isotopic number

79. The nuclides with same chemical properties and different physical properties are called

a) Isotopes b) Isomers c) Isosters d) Isomorphs

80. Which of the following is not a consequence of Rutherford's α-ray scattering experiment?

a) Atom has large empty space

b) Atoms give line spectra instead of continuous spectra

c) Atom has positively charged centre, called nucleus

d) The positively charged centre occupies very small volume within the atom

BIOLOGY

81. Read the following taxa

a) Paramoecium *b) Penicillium* *c) Euglena* *d) Spirogyra* *e) Funaria*

f) Marselia *g) Gnetum* *h) Dolichos* i) Bacteria *j) Hydra*

In the above how many are multicellular chlorophyllous organisms.

a) Six b) Five c) Eight d) Seven

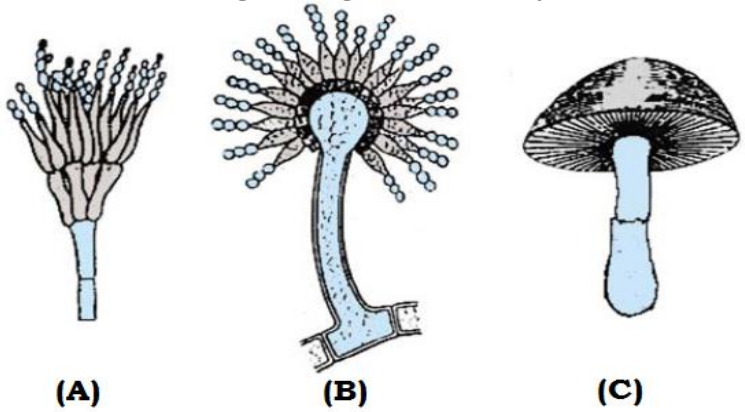
82. Arrange the following in ascending order based on the number of cell organelles present in their cells.

A) *Rhizobium* B) *Penicillium* C) *Ulothrix* D) Matured xylem tracheid

a) A → C → B → D b) D → C → A → B

c) D → A → B → C d) C → B → A → D

83. Observe the following figures, **A, B, C** and identity the experimental material used by Alexander Flemming during the discovery of first antibiotic.



a) A b) C c) B d) Both A & B

84. Pick the set of plants which do not produce fruits in their life time.

p) Pinus *q) Ipomea* r) Fern *s) Ulva*

t) Cladophora *u) Agaricus* v) Rice *w) Nostoc*

a) All except p & q b) All except u, v & w

c) All except q & r d) All except q & v

85. **Statement - I :** All fruit yielding plants are spermatophytes.

Statement - II : All spermatophytes are fruit yielding.

a) Both the Statements are true b) Both the Statements are false

c) Only Statement ' I' is true d) Only Statement 'II' is true

86. Match the following :

	Column – I		**Column – II**
I)	*Octopus*	(a)	Arthropoda
II)	*Holothuria*	(b)	Mollusca
III)	*Nereis*	(c)	Porifera
IV)	*Balanoglossus*	(d)	Echinodermata
V)	Sea anemone	(e)	Protochordata
VI)	*Chiton*	(f)	Pisces
VII)	Leech	(g)	Cnidaria
		(h)	Annelida

	I	**II**	**III**	**IV**	**V**	**VI**	**VII**		**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**
a)	b	d	h	e	g	b	h	b)	d	h	e	b	g	b	h
c)	h	b	g	e	h	d	b	d)	f	b	g	h	e	e	d

87. Zygotic meiosis occur in

a) *Riccia* b) *Marsilea* c) *Paphiopedilum* d) *Spirogyra*

88. Pick the correct expression of N_2-fixation in legumes.

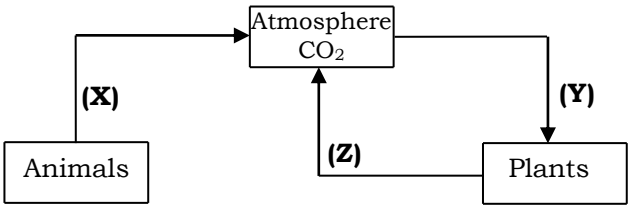
a) $N_2 \rightarrow NO_2^- \rightarrow NO_3^- \rightarrow NH_3 \rightarrow \text{Amino acids} \rightarrow \text{Proteins}$

b) $N_2 \rightarrow NH_3 \rightarrow NO_3^- \rightarrow NO_2^- \rightarrow \text{Proteins}$

c) $NH_3 \rightarrow NO_3^- \rightarrow NO_2^- \rightarrow N_2$

d) $\text{Proteins} \rightarrow \text{Amino acids} \rightarrow NH_3 \rightarrow NO_3^- \rightarrow NO_2^- \rightarrow N_2$

89. Find the (X), (Y) & (Z) with respect to carbon cycle.



	X	Y	Z
a)	Photosynthesis	Respiration	Combustion
b)	Respiration	Photosynthesis	Photosynthesis
c)	Combustion	Respiration	Photosynthesis
d)	Respiration	Photosynthesis	Respiration

90. Elemental oxygen is normally found in the form of diatomic molecule. However, in the upper layers of the atmosphere, a molecule containing three atoms of oxygen is found. Observe the following and choose the correct option.

I) It is ozone formation
II) It is depleted by the action of CFCs
III) It protects us from U.V. radiation
IV) It may be good and bad
a) I & II only correct
b) III & IV only correct
c) 'IV' only correct
d) All are correct

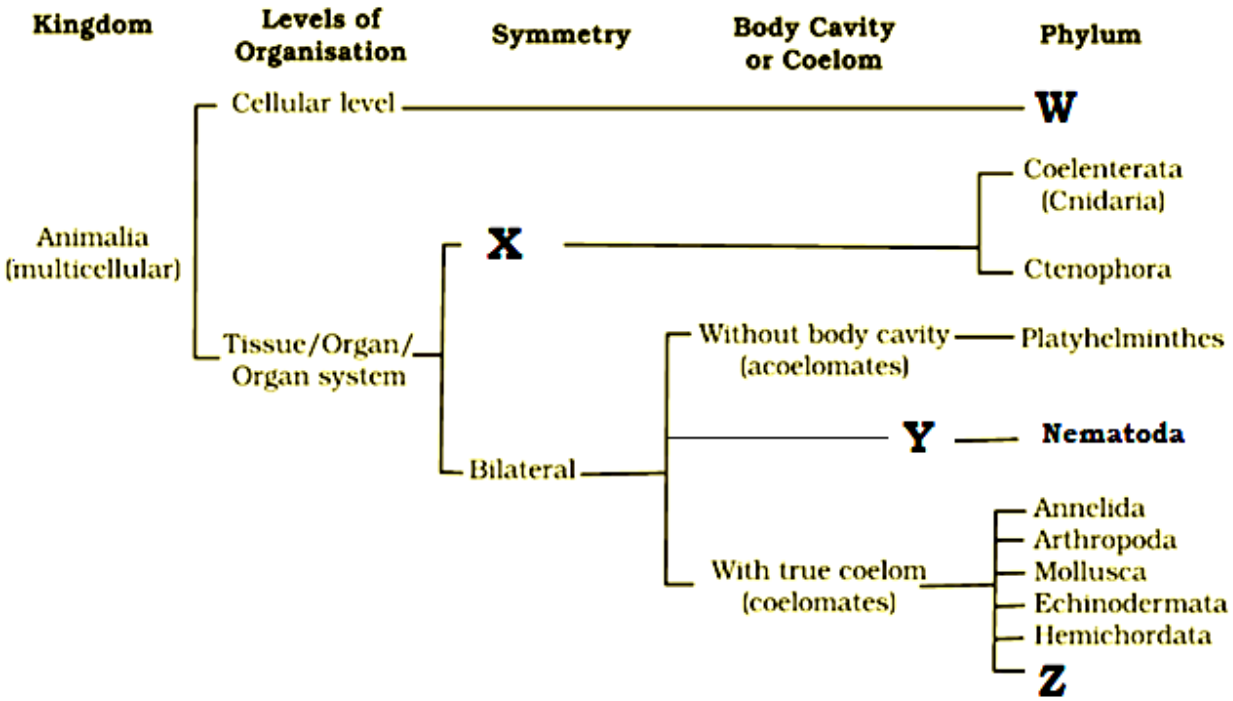
91. Some characteristics of animals are given below

(i) Notochord is present in the embryonic condition
(ii) Body is triploblastic & bilaterally symmetrical
(iii) Ventral nerve cord is present with ganglea
(iv) Pharyngeal gill pouches are seen which are paired

The characteristics that are applicable to chordates are

a) All these b) All except (ii) c) All except (iii) d) All except (iv)

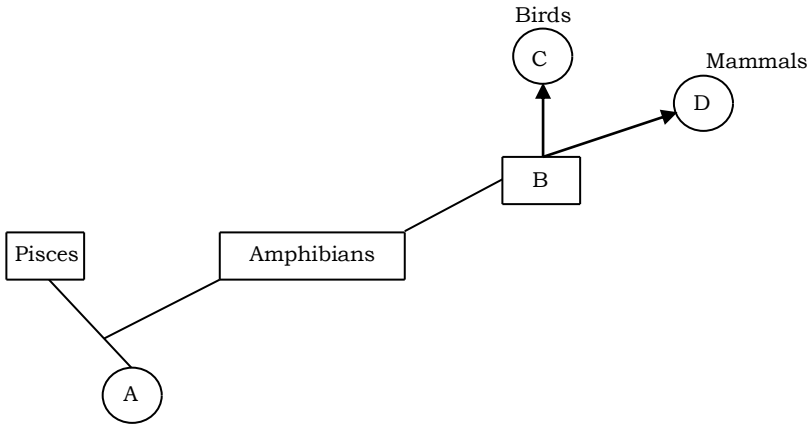
92. Observe the flow chart related to classification of animal kingdom.



Now find the correct options given below for W, X, Y & Z.

	W	X	Y	Z
a)	Protozoa	Asymmetry	Eucoelomata	Porifera
b)	Porifera	Radial	Pseudocoelomata	Chordata
c)	Chordata	Spherical	Schizocoelomata	Porifera
d)	Porifera	Biradial	Enterocoelomata	Protozoa

93. Vertebrate classification is depicted as a cladogram. Mark the correct option, by observing it.



	A	B	C	D
a)	Vertebrata	Reptilia	Feathers	Milk, hair
b)	Prochordata	Echinodermata	Shelled eggs	Limbs
c)	Four limbs	Hemichordata	Wings	Feathers
d)	Chordata	Reptilia	Milk	Shelled eggs

94. AIDS is not transmitted by this act.

a) From infected mother to infant during breast feeding

b) Blood transfusion from an infected donar to recipient

c) Through sexual contact with an infected partner

d) Casual physical contact like handshake or hug with a patient

95. Find the wrong statement with respect to immunity

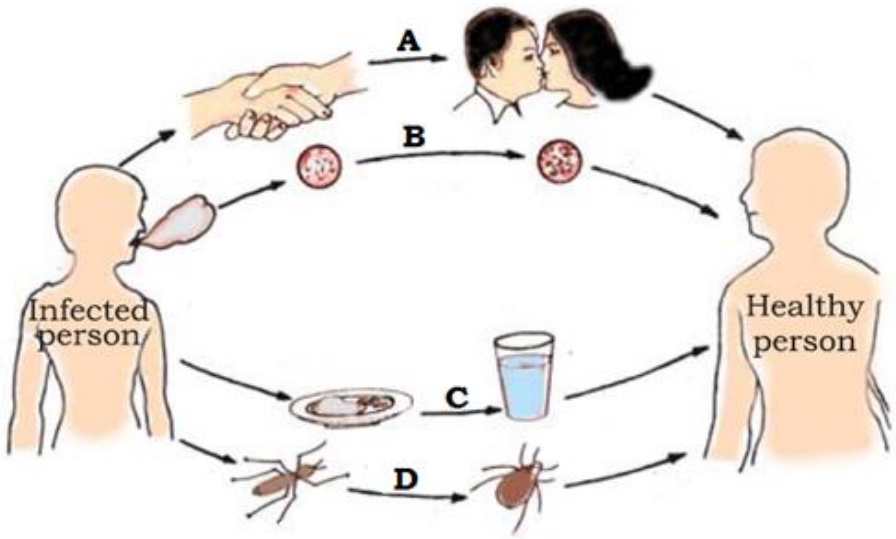
a) If a boy/girl is infected with chickenpox and got recovered he/she will not get the subsequent attack of the same disease in future

b) Secondary immune response is more intensive than that of the primary response

c) The concept of vaccination came into lime light after the experiments by Edward Jenner

d) A single vaccination is enough to prevent from all types of diseases in a child

96. Observe the given figure carefully and choose the correct option, with respect to mode of transmission



	A	B	C	D
a)	HIV	Tuberculosis	Amoebiasis	Malaria
b)	Ringworm	Common cold	Typhoid	Syphilis
c)	Common cold	Typhoid	Pneumonia	Filariasis
d)	Rabies	Chicken pox	Malaria	Dengue

97. You are moving to Africa where green fever, a viral disease is common in most of the places there. Before you leave, you paid a visit to your family Doctor. Your Doctor most likely recommends.
    a) Wash your hands before you dyne and consume freshly prepared food
    b) Carry different types of antibiotics with you
    c) Get vaccinated against the said disease
    d) Get regular blood tests & urine tests
98. We could successfully eradicate smallpox disease from the globe and also made the earth polio free, by immunization/vaccination programmes under the guidance of WHO. Unfortunately AIDS, which is also a viral disease like the above two, is not yet controlled by any vaccine. The valid reason could be
    a) Developing a vaccine is a costly affair for this disease
    b) Complex and high degree variable structure of HIV
    c) Non-availability of effective antibiotics
    d) HIV is a retrovirus and differs from the rest of viral pathogens
99. Find the gaseous cycle among the following bio-geo chemical cycles
    a) Phosphorous cycle b) Carbon cycle
    c) Water cycle d) Both a & b
100. Find the odd one out with respect to the taxon of the pathogen
    a) Malaria b) Sleeping sickness
    c) Kala-azar d) Tuberculosis

VISTO - 2015 - 16

SEASON - II ANSWER KEY

TO

CLASS - IX

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