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Date : 13/09/2015

Test No.: 0 5

Subject Code.: 1 1 1

Time : 3 Hrs. **M.M. : 360**

HORIZON TEST SERIES

for

Engineering Entrance Exam.

2016

[Test No. 5]

INSTRUCTIONS FOR STUDENTS

1. Read each question carefully.
2. It is mandatory to use Blue/Black Ball Point Pen to darken the appropriate circle in the answer sheet.
3. Mark should be dark and should complete fill the circle.
4. Rough work must be done on the Question Paper, no additional sheet will be provided for this purpose.
5. Do not use white-fluid or any other rubbing material on answer sheet. No change in the answer once marked.
6. Student cannot use log tables and calculators or any other material in the examination hall.
7. Before attempting the question paper, student should ensure that the test paper contains all pages and no page is missing.
8. Each correct answer carries four marks. One mark will be deducted for each incorrect answer from the total score.
9. Before handing over the answer sheet to the invigilator, candidate should check the particulars have been filled and marked correctly.
10. Immediately after the prescribed examination time is over, the answer sheet to be returned to the invigilator.
11. Use of Calculator and other Electronic device is not permitted.

Test No. 5

Topics of The Test

Physics	Motion in 1D & 2D
Chemistry	Chemical Bonding.
Maths	Permutations and combinations.

Test No. 5

[PHYSICS]

1. The position coordinates of a particle moving in X-Y plane as a function of time *t* are

$x = 2t^2 + 6t + 25$

$y = t^2 + 2t + 1$

The speed of the object at *t* = 10 s is approximately

(A) 31 (B) 51

(C) 71 (D) 81

2. An aeroplane flies 400m north and 300m south and then flies 1200m upwards, then net displacement is

(A) 1500m (B) 1400m

(C) 1300m (D) 1200m

3. A car moves a distance of 200 m. It covers first half of the distance at speed 60 kmh^{-1} and the second half at speed v. If the average speed is 40 kmh^{-1}, the value of v is

(A) 30 kmh^{-1} (B) 13 kmh^{-1}

(C) 60 kmh^{-1} (D) 40 kmh^{-1}

4. A particle has an initial velocity $3\hat{i} + 4\hat{j}$ and an acceleration of $0.4\hat{i} + 0.3\hat{j}$. Its speed after 10 s is

(A) 10 unit (B) 7 unit

(C) $7\sqrt{2}$ unit (D) 8.5 unit

5. A bullet fired into a fixed wooden block loses half of its velocity after penetrating 40 cm. It comes to rest after penetrating a further distance of

(A) $\frac{22}{3}$ cm (B) $\frac{40}{3}$ cm

(C) $\frac{20}{3}$ cm (D) $\frac{22}{5}$ cm

6. A body thrown vertically up to reach its maximum height in *t* second. The total time from the time of projection to reach a point at half of its maximum height while returning (in second) is

(A) $\sqrt{2}t$ (B) $\left(1+\frac{1}{\sqrt{2}}\right)t$

(C) $\frac{3t}{2}$ (D) $\frac{t}{\sqrt{2}}$

7. The velocity of particle is $v = v_0 + gt + ft^2$. If its position is x = 0 at t = 0, then its displacement after unit time (t = 1) is

(A) $v_0 + 2g + 3f$ (B) $v_0 + g/2 + f/3$

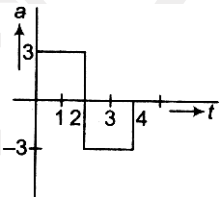
(C) $v_0 + g + f$ (D) $v_0 + g/2 + f$

8. A particle moves for 20 s with velocity 3 ms^{-1} and then moves with velocity 4 ms^{-1} for another 20 s and finally moves with velocity 5 ms^{-1} for next 20 s. What is the average velocity of the particle ?

(A) 3 ms^{-1} (B) 4 ms^{-1}

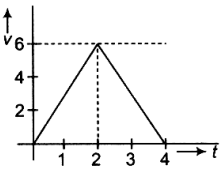
(C) 5 ms^{-1} (D) zero

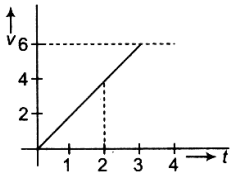
9. A particle starts from rest at *t* = 0 and undergoes an acceleration *a* in ms^{-2} with time *t* in second which is as shown

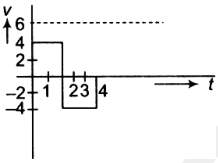


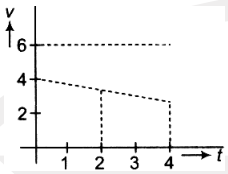
Space for Rough Work

Which one of the following plot represents velocity v in ms^{-1} *versus* time *t* in second ?

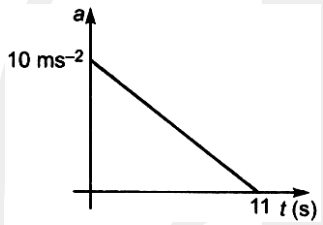
(A) 

(B) 

(C) 

(D) 

10. A particle starts from rest. Its acceleration (a) versus time (t) is as shown in the figure. The maximum speed of the particle will be



(A) 110 ms^{-1} (B) 55 ms^{-1}
(C) 550 ms^{-1} (D) 660 ms^{-1}

11. Given $A = 2\hat{i} + 3\hat{j}$ and $\mathbf{B} = \hat{i} + \hat{j}$. The component of vector **A** along vector **B** is.

(A) $\frac{1}{\sqrt{2}}$ (B) $\frac{3}{\sqrt{2}}$

(C) $\frac{5}{\sqrt{2}}$ (D) $\frac{7}{\sqrt{2}}$

12. A force is inclined at 60° to the horizontal. If its rectangular component in the horizontal direction is 50 N, then magnitude of the force in the vertical direction is

(A) 25 N (B) 75 N
(C) 87 N (D) 100 N

13. The magnitude of a vector, on the addition of two vectors $6\hat{i} + 7\hat{j}$ and $3\hat{i} + 4\hat{j}$, is

(A) $\sqrt{132}$ (B) $\sqrt{136}$

(C) $\sqrt{160}$ (D) $\sqrt{202}$

14. If two forces of 5 N each are acting along X and Y-axis, then the magnitude and direction of resultant is

(A) $5\sqrt{2}, \pi/3$ (B) $5\sqrt{2}, \pi/4$

(C) $-5\sqrt{2}, \pi/3$ (D) $-5\sqrt{2}, \pi/4$

15. For the vectors **A** and **B** making an angle θ which one of the following relations is correct ?

(A) $\mathbf{A} \times \mathbf{B} = \mathbf{B} \times \mathbf{A}$ (B) $\mathbf{A} \times \mathbf{B} = AB\sin\theta$

(C) $\mathbf{A} \times \mathbf{B} = AB\cos\theta$ (D) $\mathbf{A} \times \mathbf{B} = -\mathbf{B} \times \mathbf{A}$

16. A train of 150 m length is going towards north direction at a speed of 10 ms^{-1}. A parrot flies at a speed of 5 ms^{-1} towards south direction parallel to the railway track. The time taken by the parrot to cross the train is equal to

(A) 12 s (B) 8 s
(C) 15 s (D) 10 s

17. A particle is moving eastwards with a velocity of 5 ms^{-1}. In 10 s the velocity changes to 5 ms^{-1} northwards. The average acceleration in this time is

(A) $\frac{1}{\sqrt{2}}$ ms^{-2} towards north-east

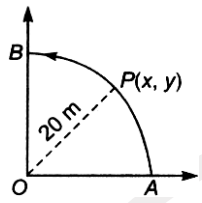
(B) $\frac{1}{2}$ ms^{-2} towards north

(C) zero

(D) $\frac{1}{\sqrt{2}}$ ms^{-2} towards north-west

Space for Rough Work

18. A point P moves in counter-clockwise direction on a circular path as shown in the figure. The movement of P is such that is sweeps out a length $s = t^3 + 5$, where s in metre and t is in second. The radius of the path is 20 m. The acceleration of P when t = 2 s is nearly



(A) 13 ms^{-2} (B) 12 ms^{-2}
(C) 7.2 ms^{-2} (D) 14 ms^{-2}

19. A cyclist goes round a circular path of circumference 34.3 m in $\sqrt{22}$ s, the angle made by him with the vertical will be

(A) 45° (B) 40°
(C) 42° (D) 48°

20. A car runs at a constant speed on a circular track of radius 100 m, taking 62.8 s for every circular lap. The average velocity and average speed for each circular lap respectively is

(A) 0, 0 (B) 0, 10 ms^{-1}
(C) 10 ms^{-1}, 10 ms^{-1} (D) 10 ms^{-1}, 0

21. If the length of the second's hand in a stop-clock is 3 cm, the angular velocity and linear velocity of the tip is

(A) 0.2047 $rads^{-1}$, 0.0314 ms^{-1}
(B) 0.2547 $rads^{-1}$, 0.314 ms^{-1}
(C) 0.1472 $rads^{-1}$, 0.06314 ms^{-1}
(D) 0.1047 $rads^{-1}$, 0.00314 ms^{-1}

22. A weightless thread can bear tension upto 37 N. A stone of mass 500 g is tied to it and revolved in a circular path of radius 4 m in a vertical plane. If g = 10 ms^{-2}, then the maximum angular velocity of the stone will be

(A) 2 rad s^{-1} (B) 4 rad s^{-1}
(C) 8 rad s^{-1} (D) 16 rad s^{-1}

23. A body moves along a circular path of radius 10 m and the coefficient of friction is 0.5. What should be its angular speed in rad s^{-1}, if it is not to slip from the surface ? (g = 9.8 ms^{-2})

(A) 5 (B) 10
(C) 0.1 (D) 0.7

24. A body is just being revolved in a vertical circle of radius R with a uniform speed. The string breaks when the body is at the highest point. The horizontal distance covered by the body after the string breaks is

(A) $2R$ (B) R
(C) $R\sqrt{2}$ (D) $4R$

25. Which of the following statements is false for a particle moving in a circle with a constant angular speed ?

(A) The velocity vector is tangent to the circle
(B) The acceleration vector is tangent to the circle
(C) The acceleration vector points to the centre of the circle
(D) The velocity and acceleration vectors are perpendicular to each other

26. A particle of mass m is projected with a velocity v making an angle of 30° with the horizontal. The magnitude of angular momentum of the projectile about the point of projection when the particle is at its maximum height h is

(A) $\frac{\sqrt{3}}{2}\frac{mv^2}{g}$ (B) zero
(C) $\frac{mv^3}{\sqrt{2}g}$ (D) $\frac{\sqrt{3}}{16}\frac{mv^3}{g}$

27. A man can throw a stone to a maximum distance of 80 m. The maximum height to which it will rise in metre, is

(A) 30 m (B) 20 m
(C) 10 m (D) 40 m

Space for Rough Work

28. A projectile is thrown in the upward direction making an angle of 60° with the horizontal direction with a velocity of 147 ms^{-1}. Then the time after which its inclination with the horizontal is 45°, is

(A) 15 s (B) 10.98 s

(C) 5.49 s (D) 2.745 s

29. A cart is moving horizontally along a straight line with constant speed 30 ms^{-1}. A projectile is to be fired from the moving cart in such a way that it will return to the cart after the cart has moved 80 m. At what speed (relative to the cart) must the projectile be fired ?

(Take g = 10 ms^{-2})

(A) 10 ms^{-1} (B) $10\sqrt{8}$ ms^{-1}

(C) $\frac{40}{3}$ ms^{-1} (D) None of the above

30. A particle moves along a parabolic path $y = 9x^2$ in such a way that the x-components of velocity remains constant and has a value $\frac{1}{3}$ ms^{-1}. The acceleration of the projectile is

(A) $\frac{1}{3}\hat{j}$ ms^{-2} (B) $3\hat{j}$ ms^{-2}

(C) $\frac{2}{3}\hat{j}$ ms^{-2} (D) $2\hat{j}$ ms^{-2}

[CHEMISTRY]

31. Sodium chloride is soluble in water but not in benzene because

(A) $\Delta H_{hydration} < \Delta H_{lattice\ energy\ in\ water}$ and

$\Delta H_{hydration} > \Delta H_{lattice\ energy\ in\ benzene}$

(B) $\Delta H_{hydration} > \Delta H_{lattice\ energy\ in\ water}$ and

$\Delta H_{hydration} < \Delta H_{lattice\ energy\ in\ benzene}$

(C) $\Delta H_{hydration} = \Delta H_{lattice\ energy\ in\ water}$ and

$\Delta H_{hydration} < \Delta H_{lattice\ energy\ in\ benzene}$

(D) $\Delta H_{hydration} < \Delta H_{lattice\ energy\ in\ water}$ and

$\Delta H_{hdydration} = \Delta H_{lattice\ energy\ in\ benzene}$

32. The lattice enthalpy and hydration enthalpy of four compounds are given below.

Compound	Lattice enthalpy (in kJ mol^{-1})	Hydration enthalpy (in kJ mol^{-1})
P	+780	–920
Q	+1012	–812
R	+828	–878
S	+632	–600

The pair of compounds which is soluble in water is

(A) P and Q (B) Q and R

(C) R and S (D) P and R

33. A coordinate bond is a dative covalent bond. Which of the below is true ?

(A) Three atom form bond by sharing their electrons

(B) Two atoms form bond by sharing their electrons

(C) Two atoms form bond and one of them provides both electrons

(D) Two atoms form bond by sharing electrons obtained from third atom.

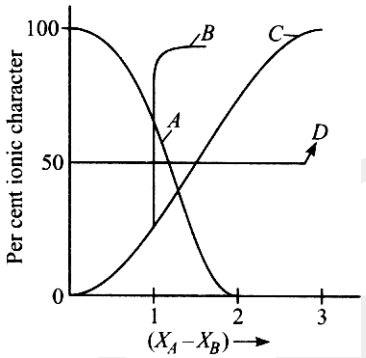
34. Carnallite in solution in water shows the properties of

(A) K^+, Mg^{2+}, Cl^- (B) $K^+, Cl^{-1}, SO_4^{2-}, Br^-$

(C) K^+, Mg^{2+}, CO_3^{2-} (D) K^+, Mg^{2+}, Cl^-, Br^-

Space for Rough Work

35. For AB bond if per cent ionic character is plotted against electronegativity difference $(X_A - Y_B)$, the shape of the curve would look like



The correct curve is

(A) A (B) B

(C) C (D) D

36. C — C bond order in benzene is

(A) 1 (B) 2

(C) between 1 and 2 (D) None of these

37. Dipole moment is shown by

(A) cis-1,2-dichloro ethene

(B) trans-1,2-dichloro ethene

(C) trans-1,2-dichloro-2 pentene

(D) Both (A) and (C)

38. The hybridisation of orbitals of N atom in NO_3^-, NO_2^+ and NH_4^+ are respectively

(A) sp, sp^2, sp^3 (B) sp^2, sp, sp^3

(C) sp, sp^3, sp^2 (D) sp^2, sp^3, sp

39. The sp^3d^2 hybridisation of central atom of a molecule would lead to

(A) square planar geometry

(B) tetrahedral geometry

(C) trigonal bipyramidal geometry

(D) octahedral geometry

40. In which reaction, the hybridisation on the central atom changes from sp^2 to sp^3 ?

(A) $NH_3 + H^+ \rightarrow NH_4^+$

(B) $BF_3 + F^- \rightarrow BF_4^-$

(C) $H_2O + H^+ \rightarrow H_3O^+$

(D) $C_2H_2 + 2H_2 \rightarrow C_2H_6$

41. (i) H—C—H angle in CH_4

(ii) Cl—B—Cl angle in BCl_3

(iii) F—I—F angle in IF_7 in a plane

(iv) I—I—I angle in I_3^-

Increasing order of above bond angles is

(A) (i)<(ii)<(iii)<(iv)

(B) (ii)<(i)<(iii)<(iv)

(C) (iii)<(i)<(ii)<(iv)

(D) (iv)<(ii)<(i)<(iii)

42. The number of sigma and pi bonds in peroxodisulphuric acid are respectively

(A) 9 and 4 (B) 11 and 4

(C) 4 and 8 (D) 4 and 9

43. Bond angles of NH_3, PH_3, AsH_3 and SbH_3 is in the order

(A) $PH_3 > AsH_3 > SbH_3 > NH_3$

(B) $SbH_3 > AsH_3 > PH_3 > NH_3$

(C) $SbH_3 > AsH_3 > NH_3 > PH_3$

(D) $NH_3 > PH_3 > AsH_3 > SbH_3$

Space for Rough Work

44. Match List I with List II. Select the correct answer using the codes given below the list.

	List I (Molecule/ion)		List II (Type of hybridisation)
A.	NH_4	1.	sp^3d^3
B.	PCl_5	2.	sp^3d
C.	SF_6	3.	sp^3
D.	IF_7	4.	sp^3d^2

Codes

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

45. The molecular shapes of SF_4, CF_4 and XeF_4 are
(A) different with 1, 0 and 2 lone pairs of electrons on the central atom, respectively
(B) different with 0,1 and 2 lone pairs of electrons on the central atom, respectively
(C) the same with 1, 1 and 1 lone pairs of electrons on the central atoms, respectively
(D) the same with 2, 0 and 1 lone pairs of electrons on the central atom, respectively

46. Geometry of SiO_4^{4-} anion is
(A) tetrahedral (B) trigonal
(C) trihedral (D) pentagonal

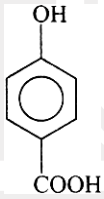
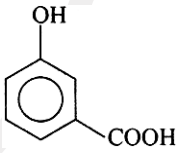
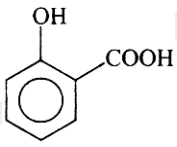
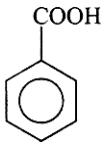
47. In BrF_3 molecule, the lone pairs occupy equatorial positions to minimize
(A) lone pair-bond pair repulsion only
(B) bond pair-bond pair repulsion only
(C) lone pair-lone pair repulsion and lone pair-bond pair repulsion
(D) lone pair-lone pair repulsion only

48. Which of the following is correct ?
(A) The number of electrons present in the valence shell of S in SF_6 is 12.
(B) The rates of ionic reactions are very slow.
(C) According to VSEPR theory, $SnCl_2$ is a linear molecule.
(D) The correct order of ability to form ionic compounds among Na^+, Mg^{2+} and Al^{3+} is $Al^{3+}>Mg^{2+}>Na^+$.

49. The *d*-orbital involved in sp^3d-hybridisation is
(A) $d_{x^2-y^2}$ (B) d_{xy}
(C) d_{z^2} (D) d_{zx}

50. Chlorine atom, in its third excited state, reacts with fluorine to form a compound X. The formula and shape of X are
(A) ClF_5, pentagonal
(B) ClF_4, tetrahedral
(C) ClF_4, pentagonal bipyramidal
(D) ClF_7, pentagonal bipyramidal

51. Which is a pyramidal structure ?
(A) Trimethylamine (B) Methanol
(C) Acetylene (D) Water

52. Which of the following compound has maximum volatility ?
(A) 
(B) 
(C) 
(D) 

Space for Rough Work

53. Glycerol is more viscous than ethanol due to
(A) high molecular weight
(B) high boiling point
(C) many hydrogen bonds per molecule
(D) Fajan's rule

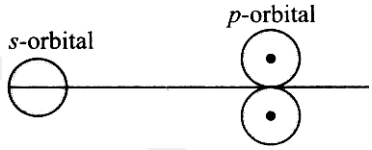
54. Unusually high boiling point of water is result of
(A) intermolecular hydrogen bonding
(B) intramolecular hydrogen bonding
(C) both intra and inter molecular hydrogen bonding
(D) high specific heat

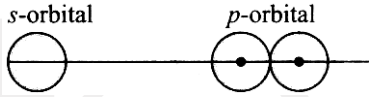
55. Metallic lustre is explained by
(A) diffusion of metal ions
(B) oscillation of loose electrons
(C) excitation of free protons
(D) existence of bcc lattice

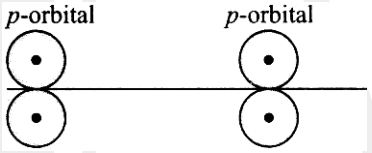
56. Given are O_2, O_2^+, O_2^{2+} and O_2^{2-} respectively. Find the correct increasing bond order
(A) $O_2 < O_2^{2-} < O_2^{2+} < O_2^+$
(B) $O_2^{2-} < O_2 < O_2^+ < O_2^{2+}$
(C) $O_2^{2-} < O_2 < O_2^+ < O_2^{2-}$
(D) $O_2^+ < O_2^{2-} < O_2 < O_2^{2+}$

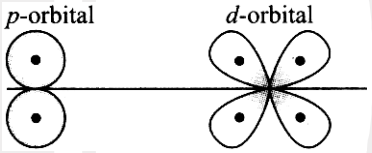
57. In forming (i) $N_2 \rightarrow N_2^+$ and (ii) $O_2 \rightarrow O_2^+$; the electrons respectively are removed from
(A) $(\overset{*}{\pi} 2p_y \text{ or } \overset{*}{\pi} 2p_x)$ and $(\overset{*}{\pi} \text{ or } \overset{*}{\pi} 2p_x)$
(B) $(\pi 2p_y \text{ or } \pi 2p_x)$ and $(\pi 2p_y \text{ or } \pi 2p_x)$
(C) $(\pi 2p_y \text{ or } \pi 2p_x)$ and $(\overset{*}{\pi} 2p_y \text{ or } \overset{*}{\pi} 2p_x)$
(D) $(\overset{*}{\pi} 2p_y \text{ or } \overset{*}{\pi} 2p_x)$ and $(\pi 2p_y \text{ or } \pi 2p_x)$

58. Which of the following is paramagnetic with bond order 0.5 ?
(A) F_2 (B) H_2^+
(C) N_2 (D) O_2^-

59. Which of the following overlaps leads to bonding ?
(A) 

(B) 

(C) 

(D) 

60. What bond order does Li_2 have ?
(A) 3 (B) 1
(C) 2 (D) 0

[MATHEMATICS]

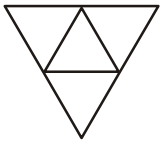
61. (i) How many numbers are there between 99 and 1000 having 7 in the units place ?
(ii) How many numbers are there between 99 and 1000 having atleast one of their digits is 7 ?
(A) 90, 253 (B) 90,258
(C) 90,252 (D) 90,352

Space for Rough Work

62. In how many ways can this diagram be coloured subject to the following two conditions ?

(i) Each of the smaller triangle is to be painted with one of three colours : red, blue or green.

(ii) No two adjacent regions have the same colour.



(A) 20 (B) 24

(C) 28 (D) 30

63. In an examination, there are three multiple choice questions and each question has 4 choices. Number of ways in which a student can fail to get all answers correct is

(A) 11 (B) 12

(C) 27 (D) 63

64. A particle from origin in a Cartesian co-ordinate plane is to be carried to point (4,4) such that the movement of the point at a line is either along x-axis or along y-axis. One of such way is (0,1), (1,1), (1,2), (1,3), (2,3), (3,3), (4,3), (4,4). The total number of such ways is

(A) 70 (B) 8!

(C) 2×8! (D) None of these

65. If all permutations of the letters of the word AGAIN are arranged in the order as in a dictionary, what is the 49^{th} word ?

(A) AAGIN (B) NAAGI

(C) IAAGN (D) GAAIN

66. Three married couples are to be seated in a row having six seats in a cinema hall. If spouses are to be seated next to each other, in how many ways can they be seated ? Find also the number of ways of their seating if all the ladies sit together.

(A) 40,140 (B) 48,114

(C) 45,142 (D) 42,140

67. If $\frac{1}{8!}+\frac{1}{9!}=\frac{x}{10!}$, find x.

(A) 90 (B) 100

(C) 80 (D) 95

68. The number of six digit numbers, whose all digits are odd (*i.e.,* 1,3,5,7,9), is

(A) 6^5 (B) 5^6

(C) $\frac{6!}{2!}$ (D) None of these

69. The sum of all the five digit numbers formed with the digits 1,2,3,4,5 taken all at a time, is

(A) 15 (5!) (B) 3999960

(C) 3990000 (D) None of these

70. Seven different letters are given. Then the number of ways in which words of 5 letters can be formed such that atleast one of the letters is repeated, is

(A) ${}^7P_5$ (B) 14287

(C) 5^7 (D) 7^5

71. The number of six digit numbers that can be formed from the digits 1,2,3,4,5,6,7 so that digits do not repeat and the terminal digits are even, is

(A) 144 (B) 72

(C) 288 (D) 720

72. If $\frac{{}^nP_{r-1}}{a}=\frac{{}^nP_r}{b}=\frac{{}^nP_{r+1}}{c}$, then

(A) $b^2=a(b+c)$ (B) $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=1$

(C) $a^2=c(a+b)$ (D) $abc=1$

73. Find the number of arrangements of the letters of the word INDEPENDENCE when words begin with I and end in P.

(A) 12400 (B) 12420

(C) 12600 (D) 12620

Space for Rough Work

74. In how many ways can 15 members of a council sit along a circular table, when the Secretary is to sit on one side of the Chairman and the Deputy Secretary on the other side ?

(A) 2×12! (B) 24
(C) 2×15! (D) None of these

75. 20 persons are invited for a party. In how many different ways can they and the host be seated at circular table, if the two particular persons are to be seated on either side of the host ?

(A) 20! (B) 2×18!
(C) 18! (D) None of these

76. In how many ways can 5 boys and 5 girls sit in a circle so that no two boys sit together ?

(A) 5!×5! (B) 4!×5!
(C) $\frac{5!\times 5!}{2}$ (D) $\frac{(4!)\times(4!)}{2!}$

77. In a small village, there are 87 families, of which 52 families have atmost 2 children. In a rural development programme 20 families are to be chosen for assistance of which at least 18 families must have at most 2 children. In how many ways can the choice be made ?

(A) ${}^{52}C_{18}\,{}^{35}C_{2}$
(B) ${}^{52}C_{18}\times{}^{35}C_{2}+{}^{52}C_{19}\times{}^{35}C_{1}+{}^{52}C_{20}$
(C) ${}^{52}C_{18}+{}^{35}C_{2}+{}^{52}C_{19}$
(D) ${}^{52}C_{18}\times{}^{35}C_{2}+{}^{35}C_{1}\times{}^{52}C_{19}$

78. A crocodile is known to have not more than 68 teeth. The total number of crocodiles with different set of teeth, are

(A) 68 (B) 68!
(C) 16^{17} (D) 68^{68}

79. The value of $\frac{{}^{10}C_r}{{}^{11}C_r}$, when the numerator and denominator takes its greatest value, is

(A) $\frac{6}{11}$ (B) $\frac{5}{11}$
(C) $\frac{10}{6}$ (D) $\frac{10}{5}$

80. For a game in which two partners play against two other partners, six persons are available. If every possible pair must play with every other possible pair, then the total number of games played is

(A) 90 (B) 45
(C) 30 (D) 60

81. The number of ways of selecting 8 books from library which has 9 books each on Mathematics, Physics, Chemistry and English is

(A) 156 (B) 166
(C) 175 (D) 165

82. The number of natural numbers smaller than 10^4 of which all the digits are distinct are

(A) 5000 (B) 5200
(C) 5300 (D) 5274

83. There are three coplanar parallel lines. If any P points are taken on each of the lines, the maximum number of triangles with vertices at these points is

(A) ${}^{3P}C_3$ (B) $P^2(P-1)$
(C) $P^2(4P-1)$ (D) $P^2(4P-3)$

84. The number of ways in which 20 rupees can be distributed among 5 people such that each person gets atleast ₹ 3, is

(A) 26 (B) 63
(C) 125 (D) 126

85. The number of ways of dividing 52 cards amongst four players so that three players have 17 cards each and the fourth player have just one card, is

(A) $\frac{52!1}{(17!)^3}$ (B) 52!
(C) $\frac{52!}{17!}$ (D) None of these

Space for Rough Work

86. In how many ways can ₹ 16 be divided into 4 persons when none of them get less than ₹ 3 ?

(A) 70 (B) 35

(C) 64 (D) 192

87. Everybody in a room shakes hands with everybody else. The total number of handshakes is 66. The total number of persons in the room is

(A) 11 (B) 12

(C) 13 (D) 14

88. The number of triangles that are formed by choosing the vertices from a set of 12 points, seven of which lie on the same line is

(A) 105 (B) 15

(C) 175 (D) 185

89. The number of ways in which a team of eleven players can be selected from 22 players always including 2 of them and excluding 4 of them is

(A) ${}^{16}C_{11}$ (B) ${}^{16}C_{5}$

(C) ${}^{16}C_{9}$ (D) ${}^{20}C_{9}$

90. The number of ways in which we can choose a committee from four men and six women so that the committee includes atleast two men and exactly twice as many women as men is

(A) 94 (B) 126

(C) 128 (D) None of these

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Space for Rough Work