FIITJEE Admission Test

for students presently in Class 11 (Paper 2)

Time: 3 Hours (2:00 pm – 5:00 pm) **CODE: 1112-2** *Maximum Marks: 243*

Instructions:

Caution: Class, Paper, Code as given above MUST be correctly marked on the answer OMR sheet before attempting the paper. Wrong Class, Paper or Code will give wrong results.

1. **You are advised to devote 45 Minutes on Section-I and 135 Minutes on Section-II.**
2. **This Question paper consists of 2 sections. Marking scheme is given in table below:**

Section	Subject		Question no.	Marking Scheme for each question	
				Correct answer	Wrong answer
SECTION – I	PHYSICS	(PART-A)	1 to 7	+3	–1
	CHEMISTRY	(PART-B)	8 to 14	+3	–1
	MATHEMATICS	(PART-C)	15 to 21	+3	–1
SECTION – II	PHYSICS	(PART-A)	22 to 35	+3	–1
	CHEMISTRY	(PART-B)	36 to 49	+3	–1
	MATHEMATICS	(PART-C)	50 to 63	+3	–1
	PHYSICS	(PART-D)	64 to 69	+3	0
	CHEMISTRY	(PART-E)	70 to 75	+3	0
	MATHEMATICS	(PART-F)	76 to 81	+3	0

3. Answers have to be marked on the OMR sheet. The Question Paper contains blank spaces for your rough work. No additional sheets will be provided for rough work.
4. Blank papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.
5. **Before attempting paper write your OMR Answer Sheet No., Registration Number, Name** and **Test Centre** in the space provided below.
6. **See method of marking of bubbles at the back of cover page for question no. 64 to 81.**

Note: ***Please check this Question Paper contains all 81 questions in serial order. If not so, exchange for the correct Question Paper.***

OMR Answer Sheet No. : ____________________

Registration Number : ____________________

Name of the Candidate : ____________________

Test Centre : ____________________

For questions **64 to 81**

Numerical based questions single digit answer 0 to 9

Example 1:

If answer is 6.

Correct method:

⓪ ① ② ③ ④ ⑤ ● ⑦ ⑧ ⑨

Example 2:

If answer is 2.

Correct method:

⓪ ① ● ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

Recommended Time: 45 Minutes for Section – I

Section – I

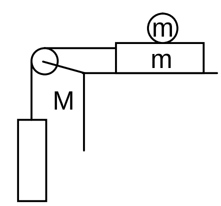
PHYSICS – (PART – A)

*This part contains **7 Multiple Choice Questions** number **1 to 7.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

1. A wheel of mass 'm' and radius 'R' is rolling on a level road at a linear speed 'v'. The kinetic energy of the upper right quarter part of the wheel will be

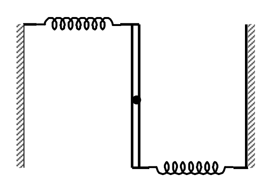
(A) $\frac{3}{8}mV^2$
(B) $\frac{9\pi-16}{48\pi}mV^2$
(C) $\frac{9\pi+16}{48\pi}mV^2$
(D) none of these

2. A plate of mass m is placed on a frictionless surface. The plate is connected to block of mass M through a string over a massless pulley. A cylinder of mass m is placed on the plate which rolls without slipping. Find the frictional force acting on the cylinder :



(A) $\frac{(M+m)g}{6}$
(B) $\frac{mg}{6}$
(C) $\frac{Mmg}{3M+4m}$
(D) $\frac{2(M+m)g}{3}$

3. A uniform rod of length L and mass M is pivoted at the centre. It's two ends are attached to two spring of equal spring constant k as shown in the figure. The rod is free of oscillate in horizontal plane. The rod is gently pushed through a small angle θ in one direction and released. The frequency of oscillation is



(A) $\frac{1}{2\pi}\sqrt{\frac{2k}{M}}$
(B) $\frac{1}{2\pi}\sqrt{\frac{k}{M}}$
(C) $\frac{1}{2\pi}\sqrt{\frac{6k}{M}}$
(D) $\frac{1}{2\pi}\sqrt{\frac{24k}{M}}$

Space for Rough Work

4. In the head on elastic collision of a heavy vehicle moving with a velocity of 10 ms^{-1} and a small stone at rest, the stone will fly away with a velocity equal to
(A) 5 ms^{-1} (B) 10 ms^{-1} (C) 20 ms^{-1} (D) 40 ms^{-1}

5. A metal ball of mass 2 kg moving with speed of 36 km/h has a head-on collision with a stationary ball of mass 3 kg. If after collision, both the balls move together, then the loss in kinetic energy due to collision is
(A) 40 J (B) 60 J (C) 100 J (D) 140 J

6. A projectile of mass *m* is thrown with velocity *v* making an angle of 30° with vertical. Neglecting air resistance the magnitude of change in momentum between the starting point and at the maximum height is
(A) $\frac{mv}{2}$ (B) $\frac{\sqrt{3}mv}{2}$ (C) mv (D) $\frac{\sqrt{7}mv}{2}$

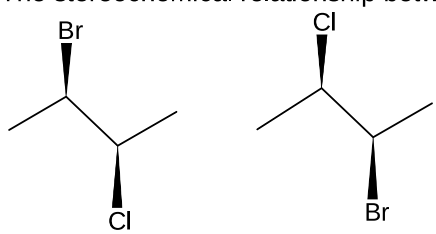
7. A ball is attached to a string and moves in a vertical circle. The string is always taut and there are absolutely no resistive forces. Which of the following statements is most correct:
(A) the net force on the ball is always vertical.
(B) the net force on the ball is always perpendicular to the velocity vector of the ball.
(C) the net force on the ball is always towards centre.
(D) the tension in the string is greatest when the ball is at its lowest point.

Space for Rough Work

CHEMISTRY – (PART – B)

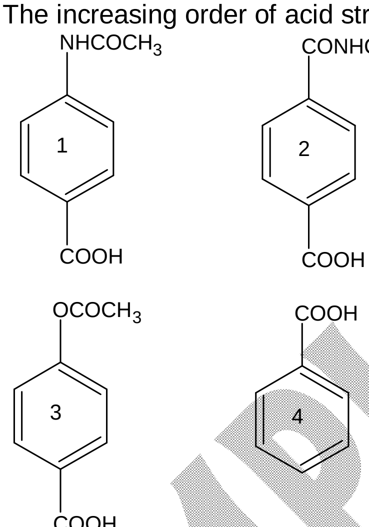
This part contains ***7 Multiple Choice Questions*** *number* ***8 to 14.*** *Each question has 4 choices (A), (B), (C) and (D), out of which* ***ONLY ONE*** *is correct.*

8. The stereochemical relationship between the following molecules is



(A) identical
(B) enantiomers
(C) distereomers
(D) constitutional isomer

9. The increasing order of acid strength of the following acid is



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

10. The maximum orbital angular momentum of an electron with n = 5 is

(A) $\sqrt{6}\frac{h}{2\pi}$
(B) $\sqrt{12}\frac{h}{2\pi}$
(C) $\sqrt{42}\frac{h}{2\pi}$
(D) $\sqrt{20}\frac{h}{2\pi}$

Space for Rough Work

11. 10 mL of $NaHC_2O_4$ is oxidised by 10 mL of 0.02 M MnO_4^- in basic medium. Hence, 10mL of $NaHC_2O_4$ is neutralised by
(A) 10 mL of 0.01 M NaOH
(B) 10 mL of 0.02 M NaOH
(C) 10 mL of 0.1 M $Ca(OH)_2$
(D) 10 mL of 0.05 M $Ba(OH)_2$

12. H_3PO_4 is a tribasic acid and one of its salt is NaH_2PO_4. What volume of 1 M NaOH solution should be added to 12g of NaH_2PO_4 to convert it into Na_3PO_4?
(A) 100 mL
(B) 200 mL
(C) 80 mL
(D) 300 mL

13. What volume of 0.1M H_2SO_4 will be required to produced 17.0 g of H_2S by the following reaction?
$5H_2SO_4 + 10NaI \rightarrow 4Na_2SO_4 + 5I_2 + H_2S + 4H_2O$
(A) 2.5 L
(B) 50.0 L
(C) 25.0 L
(D) 5.0 L

14. The equilibrium constant for a reaction
$N_2(g) + O_2(g) = 2NO(g)$ is 4×10^{-4} at 2000 K. In the presence of catalyst, the equilibrium is attained 10 times faster. The equilibrium constant in the presence of catalyst, at 2000 K is
(A) 40×10^{-4}
(B) 4×10^{-4}
(C) 4×10^{-2}
(D) incomplete data

Space for Rough Work

MATHEMATICS – (PART – C)

*This part contains **7 Multiple Choice Questions** number **15 to 21.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

15. The product of n positive numbers is unity. Then their sum is
(A) a positive integer
(B) divisible by n
(C) equal to $n + \frac{1}{n}$
(D) never less than n.

16. The least integral value of k such that $(k-2)x^2 + 8x + k + 4$ is positive for all real values of x is
(A) 1
(B) 2
(C) 3
(D) 5

17. If z be any complex number such that $|3z-2| + |3z+2| = 4$, then locus of z is
(A) an ellipse
(B) a circle
(C) a line-segment
(D) None of these

18. Value of the expression $2\sin x - \cos 2x$ is always
(A) greater than or equal to -3/2
(B) less than or equal to 3/2
(C) greater than or equal to -1/2
(D) none of these

19. The value of $\frac{1}{6.10} + \frac{1}{10.14} + \frac{1}{14.18} + ... \infty$ equals to
(A) $\frac{1}{(24)^2}$
(B) $\frac{1}{6}$
(C) $\frac{1}{24}$
(D) $\frac{1}{(24)^3}$

20. Find minimum value of $\sin^4 x + \cos^4 x$?
(A) 1
(B) $\frac{1}{2}$
(C) $\frac{1}{4}$
(D) 0

21. If $x + y = k$ is normal to parabola $y^2 = 12x$. Find k?
(A) 3
(B) 9
(C) –9
(D) 3

Space for Rough Work

Recommended Time: 135 Minutes for Section – II

Section – II

PHYSICS – (PART – A)

*This part contains **14 Multiple Choice Questions** number **22 to 35.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

22. A wire of length L, cross-sectional area A is made of a material of Young's modulus Y. The wire is stretched by an amount x, which lies well within the elastic limit. The work done (W) by the force is
(A) $W = \frac{Yx^2}{L^2}$ (B) $W = \frac{Yx^2}{2L^2}$ (C) $W = \frac{1}{2}\frac{YAx^2}{L}$ (D) $W = \frac{YAx^2}{L}$

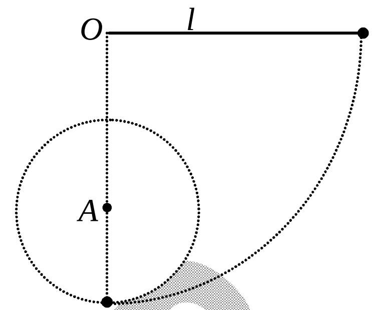
23. If time period of a body depends on density (ρ), length (a) and surface tension (S), then its value is proportional to
(A) $\frac{\rho^{1/2}a^{3/2}}{\sqrt{S}}$ (B) $\frac{\rho^{3/2}a^{3/2}}{\sqrt{S}}$ (C) $\frac{\rho^{1/2}a^{3/2}}{S^{3/4}}$ (D) $\frac{\rho^{1/2}a^{1/2}}{S^{3/2}}$

24. The coordinates of a moving particle at any time 't' are given by $x = t^3$ and $y = 4t^2$, where x and y are in metre and t in second. The acceleration of the particle at time t = 1s is given by
(A) 6 ms^{-2} (B) 8 ms^{-2} (C) 10 ms^{-2} (D) 14 ms^{-2}

25. A uniform chain has a mass M and length L. It is placed on a frictionless table with length l_0 hanging over the edge. The chain begins to slide down. The speed V with which the chain slides away from the edge is given by
(A) $V = \sqrt{\frac{gl_0}{L}\left(L + l_0\right)}$ (B) $V = \sqrt{\frac{gl_0}{L}\left(L - l_0\right)}$ (C) $V = \sqrt{\frac{g}{L}\left(L^2 - l_0^2\right)}$ (D) $V = \sqrt{2g\left(L - l_0\right)}$

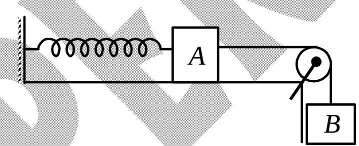
Space for Rough Work

26. A small particle of mass m is released from rest in the position shown and swings freely in vertical plane first about O and then about a peg A (Vertically below the point O) after cord comes in contact with the peg A. Find the value of OA if particle just complete the circle about A (length of string is l and string is massless and inextensible)



(A) $0.6\ l$ (B) $0.4\ l$ (C) $0.5\ l$ (D) $0.3\ l$

27. In the adjoining figure block A is of mass m and block B is of mass 2m. The spring has a force constant k. All the surfaces are smooth and the system is released from rest with spring unstretched, then



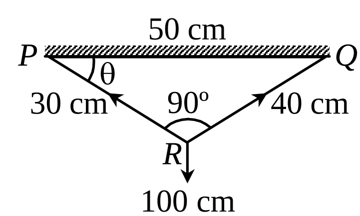
(A) The maximum extension of the spring is $\frac{4mg}{k}$

(B) The speed of block A when extension in spring is $\frac{2mg}{k}$, is $2g\sqrt{\frac{m}{k}}$

(C) Net acceleration of block B when the extension in the spring is maximum, is $\frac{g}{2}$.

(D) Tension in the thread for extension of $\frac{2mg}{k}$ in spring is mg.

28. A light string of 70 cm has its two ends tied at the same level 50 cm apart. A force of 100 N is applied at a distance of 30 cm from P. The tension in part PR is



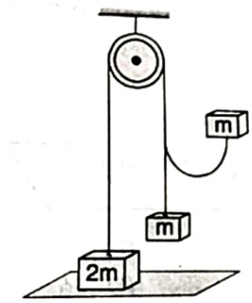
(A) 18 N (B) 8 N
(C) 0 N (D) 80 N

Space for Rough Work

29. A girl throws a ball with initial velocity v at an inclination of 45º. The ball strikes a smooth vertical wall at a horizontal distance d from the girl and after rebouncing returns to her hand. The coefficient of restitution between the wall and the ball is

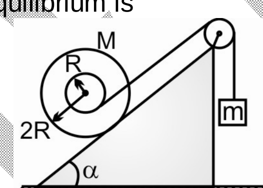
(A) $\frac{gd}{v^2}$ (B) $\frac{v^2}{gd}$ (C) $\frac{gd}{v^2 - gd}$ (D) $\frac{v^2 - gd}{v^2}$

30. A mass 2m lying on a horizontal table is attached to a light inextensible string which passes over a smooth pulley and carries a mass m at the other end. If the mass m is raised vertically through a distance h and is then dropped, then the speed with which the mass 2m begins to rise is



(A) $\frac{\sqrt{gh}}{2}$ (B) $\sqrt{gh}$ (C) $\sqrt{2gh}$ (D) $\frac{\sqrt{2gh}}{3}$

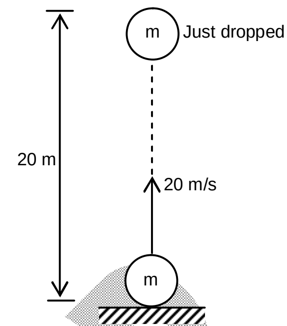
31. A spool of mass M and radius 2R lies on an inclined plane as shown in figure. A light thread is wound around the connecting tube of the spool and its free end carries a weight of mass m. The value of m so that system is in equilibrium is



(A) 2 M sin α (B) M sin α (C) 2 M tan α (D) M cos α

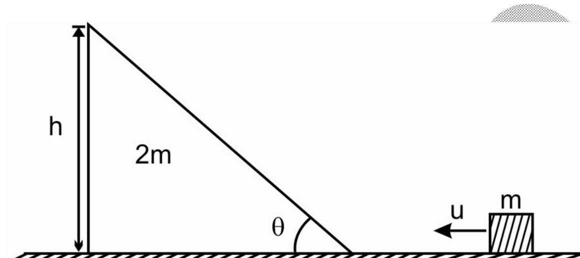
Space for Rough Work

32. The mass collides in air stick together. After how much time combined mass will fall to the ground (calculate the time from the starting when the motion was started)



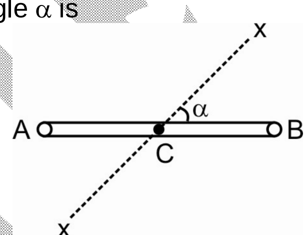
(A) $\left(1+\sqrt{2}\right)$s
(B) $2\sqrt{2}$s
(C) $\left(2+\sqrt{2}\right)$s
(D) none of these

33. A block of mass m is pushed towards a movable wedge of mass 2m and height h with a velocity u. All surfaces are smooth. The minimum value of u for which the block will reach the top of the wedge, is



(A) $2\sqrt{gh}$ (B) $\sqrt{3gh}$ (C) $\sqrt{6gh}$ (D) $\sqrt{\frac{3}{2}gh}$

34. The moment of inertia of a uniform rod of length 2*l* and mass m about an axis xx passing through its centre and inclined at an angle α is



(A) $\frac{ml^2}{3}\sin^2\alpha$ (B) $\frac{ml^2}{12}\sin^2\alpha$ (C) $\frac{ml^2}{6}\cos^2\alpha$ (D) $\frac{ml^2}{2}\cos^2\alpha$

35. The moment of inertia of a rectangular lamina of mass 'm', length 'ℓ' and width 'b' about an axis passing through its centre of mass, perpendicular to its diagonal and lies in the plane.

(A) $m\left(\frac{\ell^2+b^2}{12}\right)$
(B) $\frac{m}{12}\left[\frac{\ell^4+b^4}{\ell^2+b^2}\right]$
(C) $\frac{m}{6}\left[\frac{\ell^4+b^4}{\ell^2+b^2}\right]$
(D) none of these

Space for Rough Work

CHEMISTRY – (PART – B)

*This part contains **14 Multiple Choice Questions** number **36 to 49.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

36. Two solid compounds X and Y dissociates at a certain temperature as follows

$$X(s) \rightleftharpoons A(g) + 2B(g); K_{P_1} = 9 \times 10^{-3}\,atm^3$$

$$Y(s) \rightleftharpoons 2B(g) + C(g); K_{P_2} = 4.5 \times 10^{-3}\,atm^3$$

The total pressure of gases over a mixture of X and Y is:

(A) 4.5 atm (B) 0.45 atm
(C) 0.6 atm (D) 60 atm

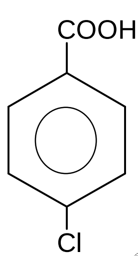
37. How many gm of solid KOH must be added to 100 mL of a buffer solution to make the pH of solution 6.0, if it is 0.1 M each w.r.t weak acid HA and salt K A.

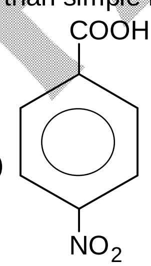
(A) 0.458 (B) 0.327
(C) 5.19 (D) 3.27

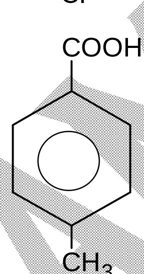
38. Which of the following species has the shortest bond length?

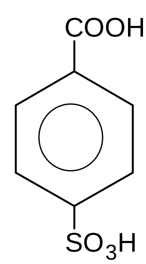
(A) NO^{2-} (B) NO^{+}
(C) NO (D) NO^{-}

39. Which aromatic acid among the following is weaker than simple benzoic acid-

(A) 

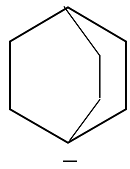
(B) 

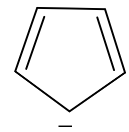
(C) 

(D) 

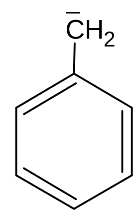
Space for Rough Work

40. Which of the following is least stable?

(A) 

(B) 

(C) $HC \equiv C^{-}$

(D) 

41. $AB_4^{-} + C^{+2} \rightarrow C^{+3} + A^{+2}$

If the O.N. of B is -2. Choose the true statement for the above change-

(A) O.N. of A decreases by +2
(B) O. N. of C decreases by + 1
(C) O.N. of A decreases by +5 and that of C increases by + 1
(D) O.N. of A decreases by +5 and that of C decreases by + 1

42. In the sixth period, the orbitals that are filled are

(A) 6s, 4f, 5d, 6p
(B) 6s, 5d, 5f, 6p
(C) 6s, 6p, 6d, 6f
(D) 6s, 5f, 6d, 6p

43. Which one of the following is the correct order of the size of the ions?

(A) $Na^{+} > Mg^{2+} > F^{-} > O^{2-}$
(B) $O^{2-} > F^{-} > Na^{+} > Mg^{2+}$
(C) $Mg^{2+} > Na^{+} > F^{-} > O^{2-}$
(D) $O^{2-} > F^{-} > Mg^{2+} > Na^{+}$

44. The correct order of increased C – O bond length of CO, CO_3^{2-} and CO_2

(A) $CO_3^{2-} < CO_2 < CO$
(B) $CO_2 < CO_3^{2-} < CO$
(C) $CO < CO_3^{2-} < CO_2$
(D) $CO < CO_2 < CO_3^{2-}$

Space for Rough Work

45. The dipole moment of LiH is found to be 2.0×10^{-29} C m. If the interatomic distance in LiH is 1.6 Å, then the percent ionic character of Li–H bond is nearly
(A) 80% (B) 60%
(C) 50% (D) 40%

46. The equilibrium constant (K_c) for the reaction $HA + B \rightleftharpoons BH^+ + A^-$ is 100. If the rate constant for the forward reaction is 10^5, then rate constant for the backward reactions
(A) 10^7 (B) 10^3
(C) 10^{-3} (D) 10^{-5}

47. When lnK is plotted against $\frac{1}{T}$ using the van't Hoff equation, a straight line is expected with a slope equal to
(A) $\Delta H^0/RT$ (B) $-\Delta H^0/R$
(C) $\Delta H^o/R$ (D) $R/\Delta H^o$

48. For the reaction $C(s) + CO_2(g) \longrightarrow 2CO(g)$, $K_p = 63$ atm at 100 K. If at equilibrium, $P_{CO} = 10\, p_{CO_2}$, then the total pressure of the gases at equilibrium is
(A) 6.3 atm (B) 6.93 atm
(C) 0.63 atm (D) 0.693 atm

49. The solubility product (K_{sp}) of AgCl is 1.8×10^{-10}. Precipitation of AgCl will occur only when equal volumes of solutions of
(A) 10^{-4} M Ag^+ and 10^{-4} M Cl^- are mixed
(B) 10^{-7} M Ag^+ and 10^{-7} M Cl^- are mixed
(C) 10^{-5} M Ag^+ and 10^{-5} M Cl^- are mixed
(D) 10^{-10} M Ag^+ and 10^{-10} M Cl^- are mixed

Space for Rough Work

MATHEMATICS – (PART – C)

This part contains 14 Multiple Choice Questions number 50 to 63. Each question has 4 choices (A), (B), (C) and (D), out of which ONLY ONE is correct.

50. Given that $z = \left(1+i\sqrt{3}\right)^{100}$, then ratio of real part of z to imaginary part of z is

(A) 2^{100} (B) 2^{50} (C) $\frac{1}{\sqrt{3}}$ (D) $\sqrt{3}$

51. Value of $\sqrt{3}\operatorname{cosec}20° - \sec 20°$ is ?

(A) 2 (B) 4 (C) $\frac{4}{\sqrt{3}}$ (D) $2\sqrt{3}$

52. If $x^3+ax+1=0$ and $x^4 + ax^2 + 1 = 0$ have a common root, then complete set of values of a is

(A) $(-\infty, -2)$ (B) $\{-2\}$
(C) $(-2, \infty)$ (D) none of these

53. $1^3 + 3^3 + 5^3 + 7^3 + ... + 99^3$ equals

(A) 2500×4990 (B) 2500×4999 (C) 250×4999 (D) 2500×4900

54. If $y = e^{\sqrt{\sin 2x}}$, find $\frac{dy}{dx}$ at $x = \frac{\pi}{12}$?

(A) $\frac{3}{2}e^{\sqrt{2}}$ (B) $\sqrt{\frac{3}{2}}e^{\sqrt{2}}$ (C) $\sqrt{\frac{3}{2}}e^{\frac{1}{\sqrt{2}}}$ (D) $\frac{3}{2}e^{\frac{1}{\sqrt{2}}}$

55. If z is a complex number such that $\left|\frac{2z-i}{z+1}\right| = 1$, then locus of z is

(A) $3x^2 + 3y^2 + 2x - 4y = 0$ (B) $3x^2 + 3y^2 - 2x - 4y = 0$
(C) $3x^2 - 3y^2 - 4y = 0$ (D) $3x^2 + 3y^2 = 2y$

56. If $\frac{x+1}{x-2} \le \frac{2}{3}$, then

(A) $7 \le x \le 10$ (B) $-7 \le x < 2$ (C) $-7 \le x \le 8$ (D) $x < -7$ or $x > 2$

Space for Rough Work

57. If $y = \cos x \cos 2x \cos 4x \cos 8x$, find $\frac{dy}{dx}$ at $x = \frac{\pi}{4}$?

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

58. The solution of the equation $\cos^2\theta + \sin\theta + 1 = 0$ lies in the interval

(A) $\left(-\frac{\pi}{4}, \frac{\pi}{4}\right)$ (B) $\left(\frac{\pi}{4}, \frac{3\pi}{4}\right)$

(C) $\left(\frac{3\pi}{4}, \frac{5\pi}{7}\right)$ (D) $\left(\frac{5\pi}{4}, \frac{7\pi}{4}\right)$

59. Sum of series $1 + \frac{1}{3} + \frac{1}{6} + \frac{1}{10} + \frac{1}{15} + ...$upto 30 terms is

(A) $\frac{61}{30}$ (B) $\frac{59}{31}$ (C) $\frac{61}{31}$ (D) $\frac{60}{31}$

60. Length of tangent drawn from point (3, –4) to circle $2x^2 + 2y^2 - 7x - 9y - 13 = 0$ is

(A) $\sqrt{13}$ (B) $\sqrt{26}$ (C) $\sqrt{39}$ (D) $2\sqrt{13}$

61. Let p(x) = 0 be a polynomial equation of least possible degree, with rational coefficients, having $\sqrt[3]{7} + \sqrt[3]{49}$ as one of its roots. Then the product of all the roots of p(x) = 0 is

(A) 7 (B) 49

(C) 56 (D) 63

62. If z_1 and z_2 are two non-zero complex numbers such that $|z_1 + z_2| = |z_1| + |z_2|$, then $\arg z_1 - \arg z_2$ is equal to

(A) $-\pi$ (B) $-\pi/2$

(C) 0 (D) $\pi/2$

63. The sum of an infinitely decreasing G.P. is equal to 4 and the sum of the cubes of its terms is equal to 64/7. Then 5th term of the progression is

(A) $\frac{1}{4}$ (B) $\frac{1}{8}$

(C) $\frac{1}{16}$ (D) $\frac{1}{32}$

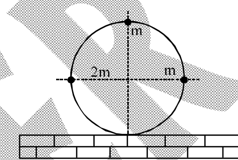
Space for Rough Work

PHYSICS – (PART – D)

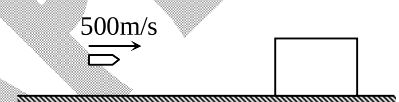
*This part contains **6 Numerical Based Questions** number **64 to 69.** Each question has **Single Digit Answer 0 to 9.***

64. A particle moves in x – y plane according to the law $x = 4t$ and $y = t(8-t)$. Where x, y are in metres and 't' in sec. Find the time (in second) after which velocity and acceleration will be mutually perpendicular.

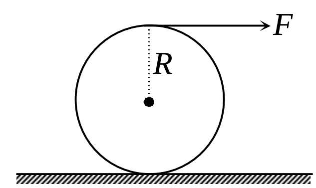
65. A ring of mass m and radius R has three particles attached to the ring as shown in the figure. The centre of the ring has a speed v_0. The kinetic energy of the system is Kmv_0^2 (Slipping is absent). Find K



66. A bullet of mass 20 g traveling horizontally with a speed of 500 m/s passes through a wooden block of mass 8.0 kg initially at rest on a level surface. The bullet emerges with a speed of 100m/s and the block slides 20 cm on the surface before coming to rest. The coefficient of friction between the block and the surface is 1/n. Find the value of n. (g = 10 ms^{-2})

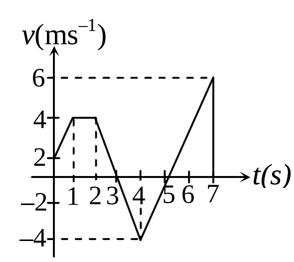


67. A hollow sphere of radius $\frac{12}{\pi}\text{m}$ lies on a smooth horizontal surface. If is pulled by a horizontal force acting tangentially at the highest point. The distance travelled in meter by the sphere during the time it makes one revolution is 8n in metre. Find the value of n.



68. The diameter of a wire is measured with a screw gauge having 50 divisions on circular scale and by one complete rotation of circular scale, main scale moves 0.5 mm. If reading of screw gauge is 0.250 cm. The minimum percentage error in the reading will be 10/x. Find the value of x.

69. The velocity-time curve of a body is shown in figure. The average speed of the body in first seven second is $\frac{19}{7}\text{ms}^{-1}$.



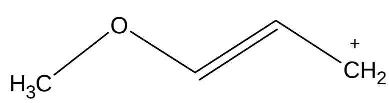
Space for Rough Work

CHEMISTRY – (PART – E)

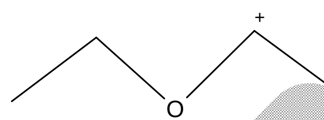
This part contains 6 Numerical Based Questions number 70 to 75. Each question has Single Digit Answer 0 to 9.

70. Find the number of molecule having two lone e^- pair, on central atom.
I_3^+, XeF_2, XeF_4, H_2O, NH_2^-, H_2S, SO_4^{2-}, NF_3, NO_2^-, $XeOF_2$

71. How many of the following carbocations have stability greater than an isopropyl cation $(CH_3)_2CH^+$?

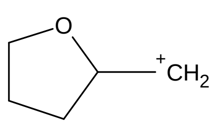


(I)

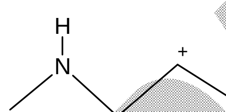


(II)

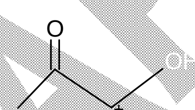
(III)



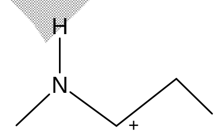
(IV)



(V)



(VI)



(VII)

72. Consider the following reaction
$N_2O_4(g) \rightleftharpoons 2NO_2(g)$
N_2O_4 gas at 2 atm is heated from 300 K to 600 K where it dissociates 50%. Calculate the new pressure in atm?

73. In a collection of H-atom, all the electrons jump from n = 5 to ground level (directly or indirectly), without emitting any line in Balmer series. The number of possible different radiations is

74. A weak acid is titrated against strong base. At half of equivalence point pH is x. 10 times dilution is made for the solution then pH of titrant will be x ± y, then y will be

75. Find the number of spectral lines obtained in Bohr spectrum of hydrogen atom when an electron is excited from 2nd orbit to 5th orbit.

Space for Rough Work

MATHEMATICS – (PART – F)

This part contains 6 Numerical Based Questions number 76 to 81. Each question has Single Digit Answer 0 to 9.

76. Number of solution of equation $\sqrt{1-\sin x} = \cos x$ in $[0, 5\pi]$ is

77. Number of points with integer coordinates that lies on or inside circle $x^2 + y^2 = 16$ is α. Find $\alpha - 40$?

78. If z is a complex number and $|z + 2 - i| = 5$ then maximum value of $|3z + 9 - 7i|$ is m. Find $\frac{m}{4}$?

79. If $f(\theta) = \frac{1-\sin 2\theta + \cos 2\theta}{2\cos 2\theta}$, find $8f(11^o)f(34^o)$?

80. If $L = \lim\limits_{x \to 0} \frac{8}{x^8}\left(1-\cos\frac{x^2}{2} - \cos\frac{x^2}{4} + \cos\frac{x^2}{2}.\cos\frac{x^2}{4}\right)$. Find $\frac{1}{8L}$?

81. If $\text{Sin}3\theta + \text{Cos}2\theta = 0$ for $\theta = \left[0, \frac{3\pi}{2}\right]$. Number of values of θ can be

Space for Rough Work

FIITJEE Admission Test
for students presently in Class 11 (Paper 2)
SAMPLE PAPER ANSWER KEY

1.	**C**	2.	**C**	3.	**C**	4.	**C**
5.	**B**	6.	**B**	7.	**D**	8.	**A**
9.	**D**	10.	**D**	11.	**A**	12.	**B**
13.	**C**	14.	**B**	15.	**D**	16.	**D**
17.	**C**	18.	**A**	19.	**C**	20.	**B**
21.	**B**	22.	**C**	23.	**A**	24.	**C**
25.	**C**	26.	**A**	27.	**A**	28.	**D**
29.	**C**	30.	**D**	31.	**A**	32.	**D**
33.	**B**	34.	**A**	35.	**B**	36.	**B**
37.	**A**	38.	**B**	39.	**C**	40.	**A**
41.	**C**	42.	**A**	43.	**B**	44.	**D**
45.	**A**	46.	**B**	47.	**B**	48.	**B**
49.	**A**	50.	**C**	51.	**B**	52.	**B**
53.	**B**	54.	**C**	55.	**B**	56.	**B**
57.	**C**	58.	**D**	59.	**D**	60.	**B**
61.	**C**	62.	**C**	63.	**B**	64.	**4**
65.	**6**	66.	**4**	67.	**2**	68.	**4**
69.	**7**	70.	**6**	71.	**3**	72.	**6**
73.	**6**	74.	**0**	75.	**6**	76.	**6**
77.	**9**	78.	**5**	79.	**4**	80.	**4**
81.	**4**						