

FIITJEE SAMPLE PAPER

(FIITJEE Talent Reward Exam - 2021)

for students presently in

Class 11 (Paper 2)



Time: 3 Hours (1:45 pm – 4:45 pm)

Code 1111

Maximum Marks: 234

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 9	+2	-0.5
	CHEMISTRY (PART-B)	10 to 18	+2	-0.5
	MATHEMATICS (PART-C)	19 to 27	+2	-0.5
SECTION – II	PHYSICS (PART-A)	28 to 41	+3	-1
	CHEMISTRY (PART-B)	42 to 55	+3	-1
	MATHEMATICS (PART-C)	56 to 69	+3	-1
	PHYSICS (PART-D)	70 to 75	+3	0
	CHEMISTRY (PART-E)	76 to 81	+3	0
	MATHEMATICS (PART-F)	82 to 87	+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 at the bottom of this sheet.
6. See method of marking of bubbles at the back of cover page for question no. 70 to 87.

Note: Please check this Question Paper contains all 87 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 **70 to 87**

Numerical based questions single digit answer 0 to 9

Example 1:

If answer is 6.

Correct method:

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

Example 2:

If answer is 2.

Correct method:

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

Recommended Time: 45 Minutes for Section – I

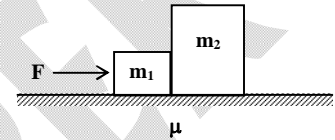
Section – I

PHYSICS – (PART – A)

This part contains 9 Multiple Choice Questions number 1 to 9. Each question has 4 choices (A), (B), (C) and (D), out of which ONLY ONE is correct.

1. If μ is the coefficient of friction between each block and floor then find the minimum value of F to move the system

- (A) $\mu m_1 g$ (B) $\mu m_2 g$
 (C) $\mu(m_1 + m_2)g$ (D) $\mu(m_1 - m_2)g$



2. A body moves 4 m towards east then 3m north. The displacement and distance covered by the body are

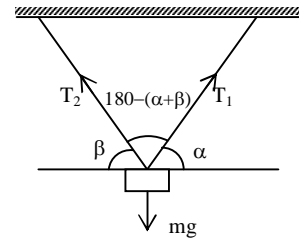
- (A) 7m, 6m (B) 6m, 5m
 (C) 5m, 7m (D) 4m, 3m

3. The dimensions of pressure gradient for a liquid in a cylinder is

- (A) $ML^{-2}T^{-2}$ (B) $ML^{-2}T^{-1}$ (C) $ML^{-1}T^{-1}$ (D) $ML^{-1}T^{-2}$

4. A body of mass m is suspended by two strings making angles α and β with the horizontal. Find the tension in the strings.

- (A) $T_1 = \frac{mg \cos \beta}{\sin(\alpha + \beta)} = T_2$
 (B) $T_1 = T_2 = \frac{mg \sin \beta}{\sin(\alpha + \beta)}$
 (C) $T_1 = \frac{mg \cos \beta}{\sin(\alpha + \beta)}$, $T_2 = \frac{mg \cos \alpha}{\sin(\alpha + \beta)}$
 (D) none of these



Space for Rough Work

5. Error in the measurement of radius of a sphere is 1%. Then the error in the measurement of volume is
 (A) 1% (B) 5%
 (C) 3% (D) 8%
6. The velocity of projection of an oblique projectile is: $\vec{v} = 3\hat{i} + 2\hat{j}$ (in m/s). The speed of the projectile at the highest point of the trajectory is,
 (A) 3 ms^{-1} (B) 2 ms^{-1}
 (C) 1 ms^{-1} (D) zero
7. A ball falls vertically on to a floor, with momentum p , and then bounces repeatedly, the coefficient of restitution is e . The total momentum imparted by the ball to the floor is
 (A) $p(1 + e)$ (B) $\frac{p}{1 - e}$ (C) $p \frac{(1 + e)}{(1 - e)}$ (D) $p \left(1 - \frac{1}{e}\right)$
8. On a horizontal frictionless frozen lake, a girl (36 kg) and a box (9 kg) are connected to each other by means of a rope. Initially they are 20 m apart. The girl exerts a horizontal force on the box, pulling it towards her. How far has the girl travelled when she meets the box?
 (A) 10 m
 (B) Since there is not friction, the girl will not move
 (C) 16 m
 (D) 4 m
9. A 750 W motor drives a pump which lifts 300 litres of water per minute to a height of 6 meters. The efficiency of the motor is nearly (take acceleration due to gravity to be 10 m/s^2)
 (A) 30% (B) 40%
 (C) 50% (D) 20%

Space for Rough Work

CHEMISTRY – (PART – B)

This part contains 9 Multiple Choice Questions number 10 to 18. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

10. How many maximum number of electrons of an atom will have the following set of quantum numbers?

$$n = 4, \ell = 0, 1, 2, m = 0, \pm 1, s = +\frac{1}{2}$$

- (A) 18
(B) 7
(C) 14
(D) 9

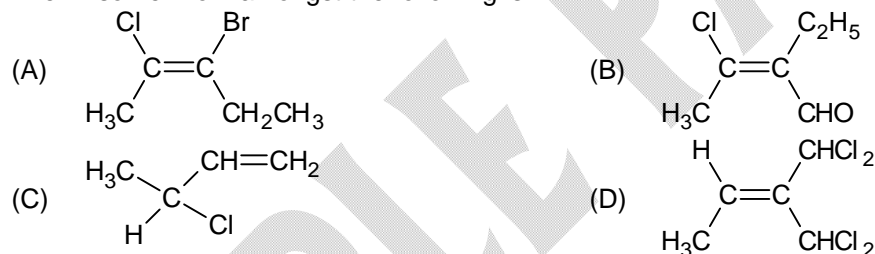
11. What will be the molarity of 36.5 mass % solution of HCl? The density of the solution is 0.8 g/mL at a certain temperature.

- (A) 0.008 M
(B) 0.8 M
(C) 8 M
(D) 80 M

12. Atoms having which of the following outermost electronic configuration has the highest value of electron gain enthalpy or electron affinity?

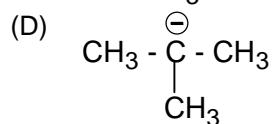
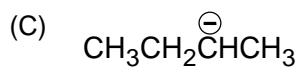
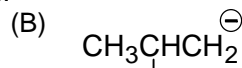
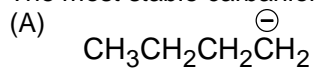
- (A) ns^2np^3
(B) ns^2np^2
(C) $(n+1)s^2(n+1)p^3$
(D) ns^2np^1

13. The E-isomer from amongst the following is

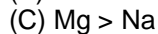
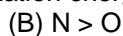
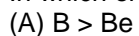


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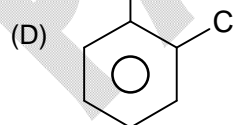
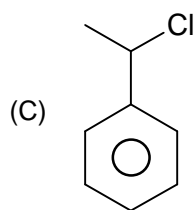
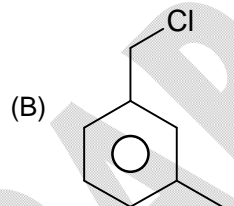
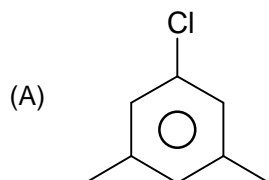
14. The most stable carbanion out of the following is:



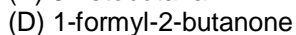
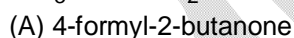
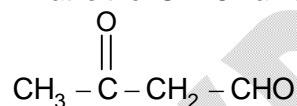
15. In which of the following option, the second ionization energy is given in the correct order.



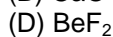
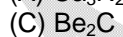
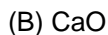
16. Which of the following compound forms the most stable carbocation on ionization?



17. What is the IUPAC name of



18. Which compound contains the largest anion?



Space for Rough Work

MATHEMATICS – (PART – C)

This part contains **9 Multiple Choice Questions** number **19 to 27**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

19. Two finite sets have m and n elements. The number of subsets of the first set is 112 more than that of the second set. The values of m and n are, respectively
 (A) 4, 7 (B) 7, 4
 (C) 4, 4 (D) 7, 7
20. General solution of $\tan 5\theta = \cot 2\theta$ will be ($n \in \mathbb{Z}$)
 (A) $\theta = \frac{n\pi}{7} + \frac{\pi}{14}$ (B) $\theta = \frac{n\pi}{7} + \frac{\pi}{5}$
 (C) $\theta = \frac{n\pi}{7} + \frac{\pi}{2}$ (D) $\theta = \frac{n\pi}{7} + \frac{\pi}{3}$
21. The sum of the radii of inscribed and circumscribed circles for an n sided regular polygon of side a , is
 (A) $\frac{a}{4} \cot\left(\frac{\pi}{2n}\right)$ (B) $a \cot\left(\frac{\pi}{n}\right)$
 (C) $\frac{a}{2} \cot\left(\frac{\pi}{2n}\right)$ (D) $a \cot\left(\frac{\pi}{2n}\right)$
22. If $w = \frac{z}{z - \frac{1}{3}i}$ and $|w| = 1$, then z lies on
 (A) an ellipse (B) a circle
 (C) a straight line (D) a parabola

Space for Rough Work

23. If $\frac{\cos \theta}{p} = \frac{\sin \theta}{q}$, then $\frac{p}{\sec 2\theta} + \frac{q}{\operatorname{cosec} 2\theta} =$
 (A) p (B) q
 (C) pq (D) $\frac{p}{q}$
24. If the two circles $(x - 1)^2 + (y - 3)^2 = r^2$ and $x^2 + y^2 - 8x + 2y + 8 = 0$ intersect in two distinct points, then
 (A) $r > 2$ (B) $2 < r < 8$
 (C) $r < 2$ (D) $r = 2$
25. If $\langle a_n \rangle$ is an A.P. and $a_1 + a_4 + a_7 + \dots + a_{16} = 147$, then $a_1 + a_6 + a_{11} + a_{16} =$
 (A) 96 (B) 98
 (C) 100 (D) none of these
26. If the focus of a parabola is $(1, 0)$ and its directrix is $x + y = 5$, then its vertex is,
 (A) $(0, 1)$ (B) $(0, -1)$
 (C) $(2, 1)$ (D) $(3, 2)$
27. The equation of an ellipse, whose length of major axis is 8 and eccentricity $\frac{1}{2}$, is
 (A) $3x^2 + 4y^2 = 12$ (B) $3x^2 + 4y^2 = 48$
 (C) $4x^2 + 3y^2 = 12$ (D) $3x^2 + 9y^2 = 12$

Space for Rough Work

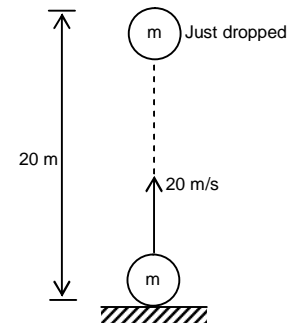
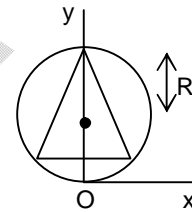
Recommended Time: 135 Minutes for Section – II

Section – II

PHYSICS – (PART – A)

This part contains **14 Multiple Choice Questions** number **28 to 41**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

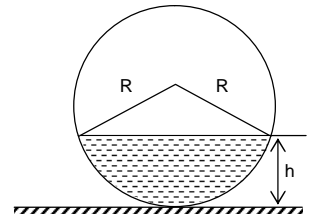
28. A rigid body rotates about a fixed axis with variable an angular velocity equal to $(\alpha - \beta t)$ at time t , where α and β are constants. The angle through which it rotates before it comes to rest is:
- (A) $\frac{\alpha^2}{2\beta}$ (B) $\frac{\alpha^2 - \beta^2}{2\alpha}$ (C) $\frac{\alpha^2 - \beta^2}{2\beta}$ (D) $\frac{\alpha(\alpha - \beta)}{2}$
29. From a uniform disc of radius R an equilateral triangle of side $\sqrt{3}R$ is removed as shown. Find out the centre of mass of the remaining figure.
- (A) $(0, 0)$ (B) $(0, R)$
 (C) $(R, 0)$ (D) $\left(0, \frac{\sqrt{3}}{2R}\right)$
30. The masses collide 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) $(1 + \sqrt{2})s$
 (B) $2\sqrt{2}s$
 (C) $(2 + \sqrt{2})s$
 (D) none of these



Space for Rough Work

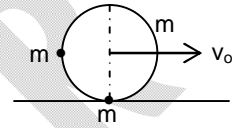
31. A liquid is filled in a spherical container of radius R till a height h . At this position the liquid surface at the edges is also horizontal. The contact angle is

- (A) 0
 (B) $\cos^{-1}\left(\frac{R-h}{R}\right)$
 (C) $\cos^{-1}\left(\frac{h-R}{R}\right)$
 (D) $\sin^{-1}\left(\frac{R-h}{R}\right)$



32. Two particles of mass m each are rigidly attached to a disc of same mass and radius R at its periphery as shown. Disc at this moment is rolling without slipping on a fixed horizontal surface. If the speed of the centre of disc is v_0 , the total kinetic energy of the system at this instant will be

- (A) mv_0^2 (B) $\frac{5}{4}mv_0^2$ (C) $\frac{7}{4}mv_0^2$ (D) $\frac{11}{4}mv_0^2$

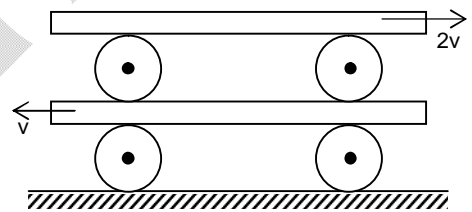


33. A person walking at the rate of 3km/hour, the rain appears to fall vertically when he increases his to speed 6 km/hr it appears to meet him at angle of 45° with vertical. The speed of rain is

- (A) $3\sqrt{2}$ km / hr (B) $\frac{3}{\sqrt{2}}$ km / hr
 (C) $6\sqrt{2}$ km / hr (D) $2\sqrt{3}$ km / hr

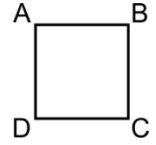
34. All cylinders are identical and no slipping at any contact. The ratio of angular speeds of upper cylinders to lower cylinders is

- (A) 1/3
 (B) 3
 (C) 1
 (D) none



Space for Rough Work

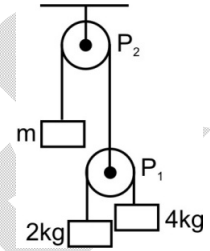
35. Four identical particles are placed at the corners of a square of side ℓ . If at $t = 0$ all the particles start moving simultaneously with speed v towards each other i.e. A towards B, B towards C and so on. Find the time after which they will combine together



- (A) $\frac{\ell}{v}$ (B) $\frac{\ell}{\sqrt{2}v}$ (C) $\frac{\sqrt{2}\ell}{v}$ (D) $\frac{2\ell}{v}$

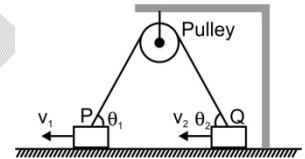
36. For what value of m (in kg), the pulley P_1 remains at rest.

- (A) 6
(B) 2
(C) 10.66
(D) 5.33



37. In the figure shown, block P and Q move towards left with velocity v_1 and v_2 along horizontal direction respectively, then the ratio of $\frac{v_1}{v_2}$ will be

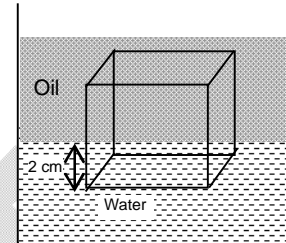
- (A) $\frac{\cos\theta_1}{\cos\theta_2}$ (B) $\frac{\cos\theta_2}{\cos\theta_1}$
(C) $\frac{\sin\theta_2}{\sin\theta_1}$ (D) $\frac{\sin\theta_1}{\sin\theta_2}$



Space for Rough Work

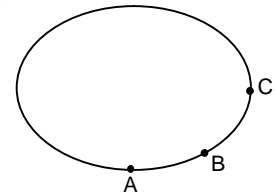
38. When a mass is rotating in a plane about a fixed point, its angular momentum is directed along
 (A) the radius
 (B) the tangent to the orbit
 (C) a line perpendicular to the plane of rotation
 (D) none of these

39. Cubical block of wood of side 10 cm floats at the interface between oil and water as shown in the figure with its lower face 2.0 cm below the interface. The density of oil 0.5 gm/cm^3 . The mass of the block is
 (A) 600gm
 (B) 680 gm
 (C) 420 gm
 (D) 210 gm



40. A particle of mass M is moving in a horizontal circle of radius R with uniform speed V . When it moves from one point to a diametrically opposite point its:
 (A) momentum does not change
 (B) momentum change by $2MV$
 (C) KE changes by MV^2
 (D) KE changes by $(1/4)MV^2$

41. A particle is moving on an elliptical path as shown, speed of the particle is constant. Its acceleration is maximum at
 (A) A
 (B) B
 (C) C
 (D) same everywhere



Space for Rough Work

CHEMISTRY – (PART – B)

This part contains **14 Multiple Choice Questions** number **42 to 55**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

42. According to Bohr's theory, the radius of orbits of H or H-like species is expressed as

$$r_n \propto \frac{n^2}{Z}$$

$$\text{or, } r_n = K \times \frac{n^2}{Z}$$

The constant K is given as:

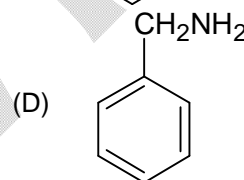
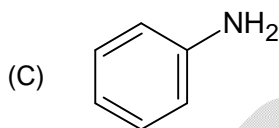
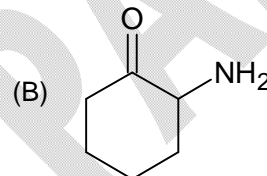
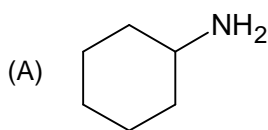
(A) $\frac{h^2}{2\pi^2me^4}$

(C) $\frac{2\pi^2me^4}{h^2}$

(B) $\frac{h^2}{4\pi^2me^2}$

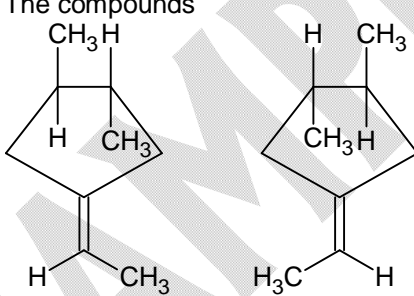
(D) $\frac{4\pi^2me^2}{h^2}$

43. Which of the following is the weakest base?



44. Phosphorus undergoes sp^3d hybridization in a series of its compounds containing F and Cl atoms. Choose the correct statement.
- (A) The dipole moment of PF_2Cl_3 is higher than that of PF_3Cl_2
- (B) Phosphorus displays maximum electronegativity in PF_2Cl_3 as compared to other compounds like PF_3Cl_2 , PF_4Cl etc.
- (C) The crystal structure of PCl_2F_3 contains $[PCl_4]^+$ and $[PF_6]^-$
- (D) The bond angle $\angle ClPCl$ in $PFCl_4$ is 180°

Space for Rough Work

45. Which of the following solutions make buffer?
 (A) NaOH + CH₃COOH (1:1 molar ratio) (B) NaOH + CH₃COOH (2:1 molar ratio)
 (C) NaOH + CH₃COOH (1:2 molar ratio) (D) NaOH + CH₃COOH (4:3 molar ratio)
46. The solubility product of PbI₂ is $32 \times 10^{-9} \text{ mol}^3 \text{ L}^{-3}$ at a certain temperature. What is the molarity of the saturated solution of PbI₂?
 (A) 0.0002 M (B) 0.002 M
 (C) 0.2 M (D) 0.02 M
47. 0.98g of a polybasic acid (mol.mass = 98) requires 30 mL of 0.5 M Ba(OH)₂ for complete neutralization. What is the basicity of the acid?
 (A) 4 (B) 2
 (C) 3 (D) 1
48. $X(g) \rightleftharpoons Y(g) + Z(g)$
 The equilibrium constant K_p of above reaction is 3 atm at a certain temperature. If equal moles of X, Y and Z are present at equilibrium, the equilibrium pressure would be:
 (A) 12 atm (B) 3 atm
 (C) 6 atm (D) 9 atm
49. For which of the following reaction $K_p = K_c$?
 (A) $2\text{SO}_3(g) \rightleftharpoons 2\text{SO}_2(g) + \text{O}_2(g)$ (B) $\text{N}_2(g) + 3\text{H}_2(g) \rightleftharpoons 2\text{NH}_3(g)$
 (C) $\text{C}(s) + \text{O}_2(g) \rightleftharpoons \text{CO}_2(g)$ (D) $\text{MgCO}_3(s) \rightleftharpoons \text{MgO}(s) + \text{CO}_2(g)$
50. In which state a chlorine atom contains five unpaired electrons?
 (A) Ground state (B) First excited state
 (C) Second excited state (D) Third excited state
51. The compounds
- 

are:
- (A) Enantiomers (B) Diastereoisomers
 (C) Geometrical isomers (D) Same structures

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52. Which of the following molecule has the highest lattice energy?
[Assume the coordination number and Madelung constant for the compounds have same values]
- (A) CaO (B) MgO
(C) Al₂O₃ (D) BaO
53. The Lassaigne's extract is boiled with conc. HNO₃ while testing for halogens. By doing so it
- (A) decomposes Na₂S and NaCN, if any
(B) helps in precipitation of AgCl
(C) increases the solubility of product of AgCl
(D) increases the concentration of NO₃⁻ ions
54. 0.30 g of an organic compound containing C, H and O on combustion yields 0.44 g CO₂ and 0.18 g H₂O. If one mole of the compound weighs 60 g, then molecular formula of the compound is
- (A) C₃H₈O (B) C₂H₄O₂
(C) CH₂O (D) C₄H₆O
55. Which of the following concentration term does **NOT** depend on temperature?
- (A) Molarity (B) Molality
(C) Formality (D) Normality

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MATHEMATICS – (PART – C)

This part contains **14 Multiple Choice Questions** number **56 to 69**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

56. If x_1, x_2, x_3 as well as y_1, y_2, y_3 are in G.P. with the same common ratio, then the points $(x_1, y_1), (x_2, y_2)$ and (x_3, y_3)
- (A) lie on a straight line
(B) lie on an ellipse
(C) lie on a circle
(D) are vertices of a triangle
57. Let z and w are two non zero complex numbers such that $|z| = |w|$, and $\text{Arg}(z) + \text{Arg}(w) = \pi$, then
- (A) $z = w$
(B) $z = \bar{w}$
(C) $\bar{z} = \bar{w}$
(D) $z = -\bar{w}$
58. The locus of a point $P(\alpha, \beta)$ moving under the condition that the line $y = \alpha x + \beta$ is a tangent to the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ is
- (A) an ellipse
(B) a circle
(C) a parabola
(D) a hyperbola
59. If $X \cup \{1, 2\} = \{1, 2, 3, 5, 9\}$, then
- (A) the smallest set X is $\{3, 5, 9\}$
(B) the smallest set X is $\{2, 3, 5, 9\}$
(C) the largest set X is $\{1, 2, 5, 9\}$
(D) the largest set X is $\{2, 3, 4, 9\}$

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60. If $y = \frac{\sin x + \cos x}{\sin x - \cos x}$, then $\frac{dy}{dx}$ at $x = 0$ is $(-n)$. Find n
- (A) 2 (B) 3
(C) 4 (D) 5
61. $\sin^2 \frac{\pi}{8} + \sin^2 \frac{3\pi}{8} + \sin^2 \frac{5\pi}{8} + \sin^2 \frac{7\pi}{8}$ is equal to
- (A) 1 (B) -1
(C) 0 (D) 2
62. The value of $\cos \frac{2\pi}{7} + \cos \frac{4\pi}{7} + \cos \frac{6\pi}{7}$ is equal to
- (A) 1 (B) -1
(C) $\frac{1}{2}$ (D) $-\frac{1}{2}$
63. A focus of an ellipse is at origin. The directrix is the line $x = 4$ and the eccentricity is $\frac{1}{2}$. Then the length of the semi-major axis is
- (A) $\frac{1}{2}$ (B) $\frac{4}{5}$
(C) $\frac{1}{\sqrt{5}}$ (D) $\frac{8}{3}$
64. The sum of the series $\frac{5}{13} + \frac{55}{13^2} + \frac{555}{13^3} + \dots \infty$ is
- (A) 50/27 (B) 13/36
(C) 65/36 (D) none of these

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65. A variable circle passes through the fixed point $A(p, q)$ and touches x - axis. The locus of the other end of the diameter through A is-
- (A) $(x - p)^2 = 4qy$ (B) $(x - q)^2 = 4py$
 (C) $(y - p)^2 = 4qx$ (D) $(y - q)^2 = 4px$
66. Let $X = \{1, 2, 3, 4, 5\}$ and $Y = \{1, 3, 5, 7, 9\}$. Then which of the following is not a relation from X to Y
- (A) $R_1 = \{(x, y) | y = 2 + x, x \in X, y \in Y\}$
 (B) $R_2 = \{(1, 1), (2, 1), (3, 3), (4, 3), (5, 5)\}$
 (C) $R_3 = \{(1, 1), (1, 3), (3, 5), (3, 7), (5, 7)\}$
 (D) $R_4 = \{(1, 3), (2, 5), (2, 4), (7, 9)\}$
67. The sum of infinite series $\frac{1}{1 \times 4} + \frac{1}{4 \times 7} + \frac{1}{7 \times 10} + \dots \dots \dots \infty$ is
- (A) $1/3$ (B) 3
 (C) $1/4$ (D) ∞
68. $\sin 163^\circ \cos 347^\circ + \sin 73^\circ \sin 167^\circ =$
- (A) 0 (B) $\frac{1}{2}$
 (C) 1 (D) none of these
69. $\lim_{x \rightarrow 1} \frac{x^3 - 1}{x^2 - 1}$
- (A) $\frac{3}{2}$ (B) $\frac{2}{3}$
 (C) 1 (D) -1

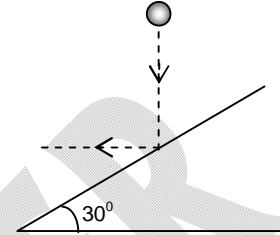
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PHYSICS – (PART – D)

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

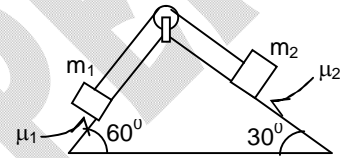
70. A ball is released from a point, it goes vertically downwards and collides with a fixed smooth inclined plane of angle of inclination of 30° from the ground, then ball goes horizontally.

The coefficient of restitution is $\frac{1}{x}$, where 'x' is



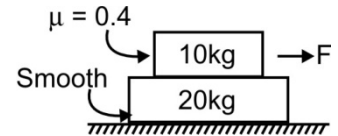
71. Two particles of masses m_1 and m_2 connected by an inextensible massless string are kept on a fixed wedge.

If $\mu_1 = \frac{1}{2}, \mu_2 = \frac{1}{3}, m_1 = 1\text{kg}, m_2 = 2\text{kg}$. Find the acceleration of the particles



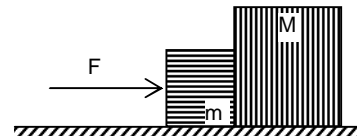
72. A car driver applies the brakes which retards the car at a rate of 8 m/s^2 . If the initial velocity of the car is 10 m/s , the speed of the car after 5 s will be

73. Coefficient of friction between 10 kg block and 20 kg is 0.4 . If the friction between them is 30 N . If the value of the force being applied on 10 kg , (the floor is smooth) is $9K$, then find the value of K .



74. The length of the component of $\vec{A} = 3\hat{i} + 4\hat{j} - \hat{k}$ along the direction of $\vec{B} = \hat{i} + \hat{j} + \hat{k}$ is given by $\sqrt{3}x$ then what is x ?

75. Two blocks of mass $m = 1\text{kg}$ and $M = 2\text{kg}$ are in contact on a frictionless table. A horizontal force $F(=3\text{N})$ is applied to m . The force (In N) of contact between the blocks will be



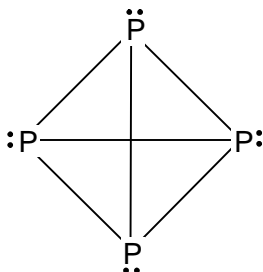
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CHEMISTRY – (PART – E)

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

76. How many vacant atomic orbital(s) is/are present in the outermost orbit of Na atom?

77.



If the ratio of the percentage of s-orbital character to the percentage of p-orbital character in a P – P bond in the above figure, is expressed as $x : y$, the value of $(x + y)$ will be

78. How many moles of electron(s) is/are present in 1.8 mL of water ($d = 1 \text{ g/cc}$)?

79. Element(X) is present in group-2 and element(Y) is present in group-15 of the periodic table. How many atoms will be present in the compound formed between X and Y?

80. A mixture containing 4 g NaOH, 10.6 g Na_2CO_3 and 8.4 g NaHCO_3 required 100 mL of HCl solution for complete reaction in presence of phenolphthalein indicator. If the molarity of the HCl solution is $x \text{ M}$, the value of x is

81. The sum of the number of unpaired electrons present in an oxygen atom and an oxygen molecule according to molecular orbital theory is:

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MATHEMATICS – (PART – F)

This part contains 6 Numerical Based Questions number 82 to 87. Each question has Single Digit Answer 0 to 9.

82. If $\sin\theta + \sin^2\theta + \sin^3\theta = 1$, then the value of $\cos^6\theta - 4\cos^4\theta + 8\cos^2\theta$ must be
83. If $\frac{5+9+13+\dots\text{to } n \text{ terms}}{7+9+11+\dots\text{to } (n+1) \text{ terms}} = \frac{17}{16}$, then n is
84. If the tangent at the point P on the circle $x^2 + y^2 + 6x + 6y = 2$ meets the straight line $5x - 2y + 6 = 0$ at a point Q on the y-axis, then the length of PQ is -
85. The foci of the ellipse $\frac{x^2}{16} + \frac{y^2}{b^2} = 1$ and the hyperbola $\frac{x^2}{144} - \frac{y^2}{81} = \frac{1}{25}$ coincide, then the value of b^2 will be
86. The number of integral values of x satisfying $\frac{(x-2)(2x-3)^2(x-6)^3}{(x+5)^4} < 0$ is
87. If the distance of 2 points P and Q from the focus of a parabola $y^2 = 4ax$ are 4 and 9 respectively, then the distance of the point of intersection of tangents at P and Q from the focus is

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FIITJEE SAMPLE PAPER – 2021

(FIITJEE Talent Reward Exam - 2021)

for students presently in

Class 11 (Paper 2)

ANSWERS

1.	C	2.	C	3.	A	4.	C
5.	C	6.	A	7.	C	8.	D
9.	B	10.	B	11.	C	12.	B
13.	B	14.	A	15.	A	16.	C
17.	B	18.	C	19.	B	20.	A
21.	C	22.	C	23.	A	24.	B
25.	B	26.	C	27.	B	28.	A
29.	B	30.	D	31.	B	32.	C
33.	A	34.	B	35.	A	36.	D
37.	B	38.	C	39.	A	40.	B
41.	C	42.	B	43.	C	44.	C
45.	C	46.	B	47.	C	48.	D
49.	C	50.	C	51.	A	52.	C
53.	A	54.	B	55.	B	56.	A
57.	D	58.	D	59.	A	60.	A
61.	D	62.	D	63.	D	64.	C
65.	A	66.	D	67.	A	68.	B
69.	A	70.	3	71.	0	72.	0
73.	5	74.	2	75.	2	76.	8
77.	4	78.	1	79.	5	80.	2
81.	4	82.	4	83.	7	84.	5
85.	7	86.	3	87.	6		