

PHYSICS, CHEMISTRY & MATHEMATICS**QP Code: 100082****PAPER - 1****Time Allotted: 3 Hours****Maximum Marks: 402**

- Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.
- You are not allowed to leave the Examination Hall before the end of the test.

INSTRUCTIONS

Caution: Question Paper CODE as given above MUST be correctly marked in the answer OMR sheet before attempting the paper. Wrong CODE or no CODE will give wrong results.

A. General Instructions

1. Attempt ALL the questions. Answers have to be marked on the OMR sheets.
2. This question paper contains **Three Sections**.
3. **Section-I** is Physics, **Section-II** is Chemistry and **Section-III** is Mathematics.
4. Each **Section** is further divided into **Two Parts: Part-A & B** in the OMR.
5. Rough spaces are provided for rough work inside the question paper. No additional sheets will be provided for rough work.
6. Blank Papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.

B. Filling of OMR Sheet

1. Ensure matching of OMR sheet with the Question paper before you start marking your answers on OMR sheet.
2. On the OMR sheet, darken the appropriate bubble with HB pencil for each character of your Enrolment No. and write in ink your Name, Test Centre and other details at the designated places.
3. OMR sheet contains alphabets, numerals & special characters for marking answers.

C. Marking Scheme For All Two Parts.

- (i) **Part-A (01-07)** – Contains seven (07) multiple choice questions which have **One or More** correct answer.
Full Marks: +6 If only the bubble(s) corresponding to all the correct options(s) is (are) darkened.
Partial Marks: +1 For darkening a bubble corresponding to **each correct option**, provided NO incorrect option is darkened.
Zero Marks: 0 If none of the bubbles is darkened.
Negative Marks: -1 In all other cases.
For example, if (A), (C) and (D) are all the correct options for a question, darkening all these three will result in **+6 marks**; darkening only (A) and (D) will result in **+2 marks**; and darkening (A) and (B) will result in **-1 marks**, as a wrong option is also darkened.
- (ii) **Part-A (08-14)** – Contains seven (07) multiple choice questions which have **ONLY ONE CORRECT** answer. Each question carries **+6 marks** for correct answer and **-2 marks** for wrong answer.
- (iii) **Part-A (15-18)** - This section contains Two paragraphs. Based on each paragraph, there are Two multiple choice questions. Each question has only one correct answer and carries **+5 marks** for the correct answer and **-1 marks** for wrong answer.
- (iv) **Part-B (01-05)** contains five (05) Numerical based questions, the answer of which maybe positive or negative numbers or decimals to **Two decimal places** (e.g. 6.25, 7.00, -0.33, -.30, 30.27, -127.30) and each question carries **+6 marks** for correct answer and **there will be no negative marking**.

Name of the Candidate : _____

Batch : _____ Date of Examination : _____

Enrolment Number : _____

SECTION-1 : PHYSICS

PART – A

(Multi Correct Choice Type)

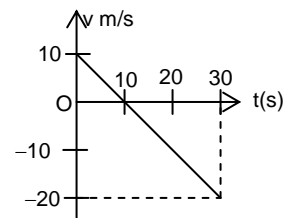
This section contains 7 **multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONE OR MORE** may be correct.

1. The force exerted by the floor of an elevator on the foot of a person standing there is more than the weight of the person if the elevator is
 (A) going up and slowing down (B) going up and speeding up
 (C) going down and slowing down (D) going down and speeding up.

2. It $\vec{A} = \sqrt{3}\hat{i} + \hat{j}$
 & $\vec{B} = \sqrt{3}\hat{i} - \hat{j}$
 and angle between \vec{A} & \vec{B} is θ then
 (A) $\theta = 60^\circ$ (B) $\theta = 90^\circ$
 (C) $\vec{A} \cdot \vec{B} = 0$ (D) Component of \vec{A} along $\vec{B} = 1$

3. A man who can swim at a speed v relative to the water wants to cross a river of width d , flowing with a speed u . The point opposite him across the river is P.
 (A) The minimum time in which he can cross the river is $\frac{d}{v}$.
 (B) He can reach the point P in time $\frac{d}{v}$.
 (C) He can reach the point P in time $\frac{d}{\sqrt{v^2 - u^2}}$
 (D) He cannot reach P if $u > v$.

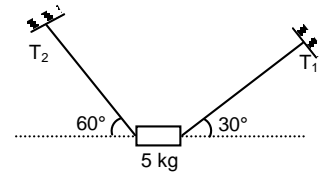
4. The velocity-time graph for a particle moving on a straight line is shown in figure.
 (A) the particle has constant acceleration.
 (B) the particle has never turned around.
 (C) the particle has zero displacement.
 (D) the average speed in the interval 0 to 10 s is the same as the average speed in the interval 10 s to 20 s.



5. Which of the following statement(s) is/are true for motion with uniform velocity?
 (A) motion is always along a straight line path
 (B) motion is always in the same direction
 (C) magnitude of displacement will be less than distance covered
 (D) average velocity is equal to instantaneous velocity

Space For Rough Work

6. A body of mass 5 kg is suspended by the strings making angles 60° and 30° with the horizontal as shown in the figure ($g = 10 \text{ ms}^{-2}$). Then
- (A) $T_1 = 25 \text{ N}$
 (B) $T_2 = 25 \text{ N}$
 (C) $T_1 = 25\sqrt{3} \text{ N}$
 (D) $T_2 = 25\sqrt{3} \text{ N}$



7. A vector \vec{A} has magnitude A and \hat{A} is unit vector in the direction of \vec{A} , then which of the following are correct
- (A) $\vec{A} \cdot \hat{A} = A$ (B) $\hat{A} = \frac{\vec{A}}{A}$ (C) $\vec{A} \cdot \vec{A} = A^2$ (D) $A = \frac{\vec{A}}{\hat{A}}$

(Single Correct Choice Type)

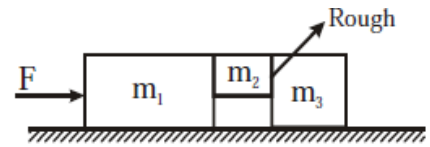
This section contains **7 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct**.

8. Two vectors \vec{P} and \vec{Q} are perpendicular to each other and $|\vec{P}| = 2|\vec{Q}|$. The angle between $\vec{P} + \vec{Q}$ and $(\vec{P} \times \vec{Q})$ is
- (A) $\cos^{-1}(1/2\sqrt{2})$ (B) $\frac{\pi}{4}$ (C) $\frac{\pi}{2}$ (D) $\cos^{-1}(3/5)$
9. A train passes an observer standing on a platform. The first carriage of the train passes the observer in time $t_1 = 1 \text{ s}$ and the second carriage in $t_2 = 1.5 \text{ s}$. Find its acceleration assuming it to be constant. The length of each carriage is : $l = 12 \text{ m}$
- (A) 3.3 m/s^2 (B) -3.2 m/s^2 (C) 24 m/s^2 (D) -24 m/s^2
10. If the initial velocity of a particle is $\vec{u} = \hat{i} + \hat{k} \text{ m/s}$ and acceleration $\vec{a} = 2\hat{j} \text{ m/s}^2$, the velocity of the particle after one second is
- (A) 4 m/s (B) $\sqrt{6} \text{ m/s}$
 (C) $2\sqrt{2} \text{ m/s}$ (D) 1 m/s
11. A ball is projected with velocity v_0 at an angle θ with the ground. The time after which the velocity of the ball is perpendicular to its initial direction of motion is
- (A) $\frac{v_0}{g \cos \theta}$ (B) $\frac{v_0}{g \sin \theta}$ (C) $\frac{v_0}{g} \tan \theta$ (D) $\frac{v_0}{g} \cot \theta$

Space For Rough Work

12. When a body of mass M slides down an inclined plane of inclination θ , through a distance s , the work done by normal reaction is: (μ is coefficient of friction)
- (A) zero (B) $\mu Mg \sin \theta s$
 (C) $Mg (\mu \cos \theta - \sin \theta)s$ (D) None of the above

13. In the arrangement shown in the figure, the system of masses m_1 , m_2 and m_3 is being pushed by a force F applied on m_1 horizontally. In order to prevent the downward slipping of m_2 between m_1 and m_3 , the minimum value of F is: (the coefficient of friction between m_2 and m_3 is μ and all the other surfaces are smooth)



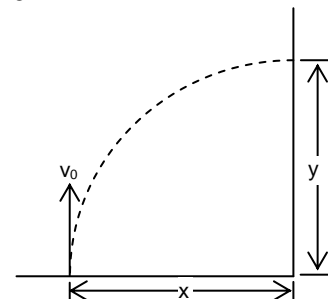
- (A) $F \geq (m_1 + m_2 + m_3) \frac{m_2 g}{\mu m_3}$ (B) $F \leq (m_1 + m_2 + m_3) \frac{m_3 g}{\mu m_2}$
 (C) $F \geq (m_1 + m_2 + m_3) \mu g$ (D) $F \leq (m_1 + m_2 + m_3) \mu g$
14. A balloon of mass M is rising up with an acceleration a . If a mass m is removed from the balloon, its acceleration becomes
- (A) $\frac{Ma + mg}{M - m}$ (B) $\frac{Ma + mg}{M + m}$
 (C) $\frac{ma + Mg}{M - m}$ (D) $\frac{ma + Mg}{M + m}$

(Paragraph Type)

This section contains **2 paragraphs**. Based upon the paragraphs **2 multiple choice questions** have to be answered. Each of these questions has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

Paragraph for Question no. 15 to 16

A particle is projected vertically with velocity v_0 , wind is blowing and is providing a constant horizontal acceleration a_0 . There is a vertical wall at some distance from point of projection. If particle strikes the vertical wall perpendicularly then calculate,



15. The time taken by the particle to hit the wall is
- (A) v_0/g (B) $2v_0/g$
 (C) $3v_0/g$ (D) $v_0/2g$

Space For Rough Work

16. Horizontal component of velocity with which particle strikes the vertical wall is
- (A) $\frac{a_0 v_0}{g}$ (B) $\frac{2a_0 v_0}{g}$
- (C) $\frac{3a_0 v_0}{g}$ (D) $\frac{a_0 v_0}{2g}$

Paragraph for Question no. 17 to 18

When a force \vec{F} acts at a point P, at position \vec{r} from the origin O, torque of this force about O is defined as $\vec{\tau} = \vec{r} \times \vec{F}$. It is a vector quantity having its direction perpendicular to both \vec{r} and \vec{F} according to the rule of cross product.

17. Find the torque of a force $\vec{F} = \hat{i} + 2\hat{j} - 3\hat{k}$ about a point O. The position vector of point of application of force about O is $\vec{r} = 2\hat{i} + 3\hat{j} - \hat{k}$
- (A) $-7\hat{i} + 5\hat{j} + \hat{k}$ (B) $3\hat{i} + 5\hat{j} - 4\hat{k}$
- (C) $2\hat{i} + 6\hat{j} + 3\hat{k}$ (D) None of these.
18. If \vec{F} be a force acting on a particle having the position vector \vec{r} and $\vec{\tau}$ be the torque of this force about the origin then
- (A) $\vec{r} \cdot \vec{\tau} = 0$ and $\vec{F} \cdot \vec{\tau} = 0$ (B) $\vec{r} \cdot \vec{\tau} \neq 0$, $\vec{F} \cdot \vec{\tau} = 0$
- (C) $\vec{r} \cdot \vec{\tau} \neq 0$ and $\vec{F} \cdot \vec{\tau} \neq 0$ (D) $\vec{r} \cdot \vec{\tau} = 0$ and $\vec{F} \cdot \vec{\tau} \neq 0$

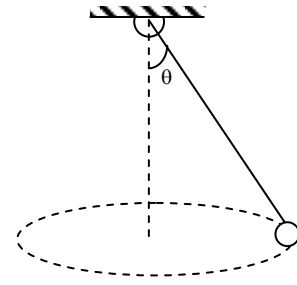
PART – B
(Numerical based)

1. A passenger is standing 20 m behind from a bus. The bus begins to move with constant acceleration 0.9 m/s^2 . To catch the bus, the passenger runs at a constant speed v towards the bus. What must be the minimum speed (in m/s) of the passenger so that he may catch the bus?

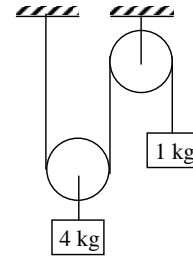
Space For Rough Work

2. 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

3. In the conical pendulum, the centripetal force will be
($\theta = 45^\circ$, $m = 0.1 \text{ kg}$, $g = 10 \text{ m/s}^2$)



4. In the system shown below the acceleration of 1 kg mass is $\frac{g}{k}$ upwards then $k = \underline{\hspace{2cm}}$

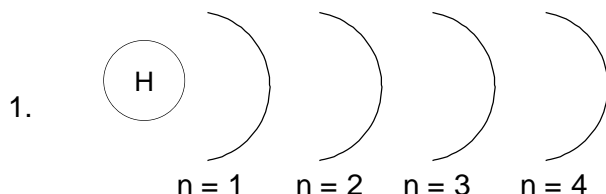


5. A balloon is ascending vertically with an acceleration of 0.2 m/s^2 . Two stones are dropped from it at an interval of 1 sec . Find the distance in m between them 1.3 sec after the first stone is released. (use $g = 9.8 \text{ m/s}^2$)

Space For Rough Work

SECTION-2 : CHEMISTRY**PART – A****(Multi Correct Choice Type)**

This section contains 7 **multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONE OR MORE** may be correct.



In a hydrogen atom, the various electronic orbits are given with their respective principal quantum numbers. Choose the correct statement(s).

- (A) The separation between the second and first orbit is $3a_0$ where a_0 is the radius of the first orbit.
- (B) The fourth orbit ($n = 4$) contains sixteen degenerate atomic orbitals.
- (C) Maximum number of electrons that can be accommodated in the second orbit ($n = 2$) is eight.
- (D) The energy difference between orbits with $n = 2$ and $n = 1$ is higher than that between orbits with $n = 3$ and $n = 4$
2.
$$\left(P + \frac{n^2 a}{V^2}\right)(V - nb) = nRT$$
- In above equation
- (A) $\frac{n^2 a}{V^2}$ is the pressure correction term
- (B) nb is called the excluded volume
- (C) this equation is valid for gases at any temperature and pressure
- (D) a and b are called van der Waal's constants
3. In which reaction(s) the equivalent mass of oxygen (O_2) is eight?
- (A) $C + O_2 \longrightarrow CO_2$
- (B) $2 Ag_2O \xrightarrow{\Delta} 4 Ag + O_2$
- (C) $2 KClO_3 \longrightarrow 2 KCl + 3 O_2$
- (D) $2 HCl + O_3 \longrightarrow Cl_2 + O_2 + H_2O$
4. The correct statement(s) regarding fluorine is
- (A) it is the most electronegative element in the periodic table
- (B) it's covalent radius is smaller than it's van der waal's radius
- (C) it's electron affinity is higher than that of chlorine
- (D) it contains one covalent bond in it's diatomic molecule

Space For Rough Work

5. In which option(s), the bond order values is/are given in correct order?
(A) $O_2 > O_2^{\oplus}$ (B) $N_2 > N_2^{\oplus}$
(C) $Li_2 > Li_2^{\oplus}$ (D) $F_2 > F_2^-$
6. If hard water containing ions like SO_4^{2-} , HCO_3^- , Mg^{2+} , Ca^{2+} is heated till complete evaporation of water, the substances left behind is/are
(A) MgO (B) CaO
(C) MgS (D) CaS
7. Which of the following compound(s) is/are more soluble than $CaCO_3$ in water?
(A) $BeCO_3$ (B) $MgCO_3$
(C) $SrCO_3$ (D) $BaCO_3$

(Single Correct Choice Type)

This section contains **7 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct**.

8. In addition to mass, which other characteristic(s) of a particle is required to find out it's de-Broglie wavelength?
(A) Orbital angular momentum (B) Velocity
(C) Amplitude of the wave (D) Volume of the particle
9. What is the oxidation number of manganese in $KMnO_4$?
(A) +5 (B) +6
(C) +7 (D) +8
10. Easily liquefiable gases should have
(A) high critical temperature
(B) higher value of 'b'(van der waal's constant)
(C) higher value of $\left(\frac{b}{a}\right)$ (a, b are van der waal's constant)
(D) higher value of R(universal gas constant)
11. Which atom has the highest value of I.E₂?
(A) $P(2s^2 2p^2)$ (B) $Q(2s^2 2p^3)$
(C) $R(2s^2 2p^4)$ (D) $S(3s^2 3p^2)$
12. Which of the following is correct regarding the molecules of O_2 , N_2 and H_2 ?
(A) They have same bond order
(B) They contains same number of π -bonds according to valence bond theory
(C) They have same atomicity
(D) They are paramagnetic species according to molecular orbital theory

Space For Rough Work

13. Which reaction produces NaOH?
(A) $\text{Na}_2\text{O} + \text{H}_2\text{O} \longrightarrow$ (B) $\text{NaCl} + \text{H}_2\text{O} \longrightarrow$
(C) $\text{NaNO}_3 + \text{H}_2\text{O} \longrightarrow$ (D) $\text{Na}_2\text{SO}_4 + \text{H}_2\text{O} \longrightarrow$
14. The sum of radial nodes and angular nodes present in a $5p_x$ orbital is
(A) 2 (B) 3
(C) 4 (D) 5

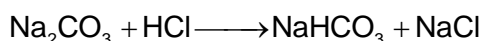
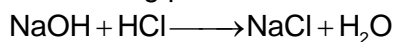
(Paragraph Type)

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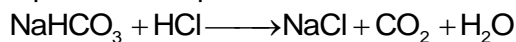
Paragraph for Question no. 15 to 16

25 mL of a solution containing NaOH and Na_2CO_3 required 30 mL of 0.25 M HCl solution for reaction in presence of phenolphthalein indicator.

The reaction taking place are



Now methyl orange is added to the reaction mixture and titration with HCl is continued. 10 mL of HCl is required in this phase of titration. The reaction taking place is

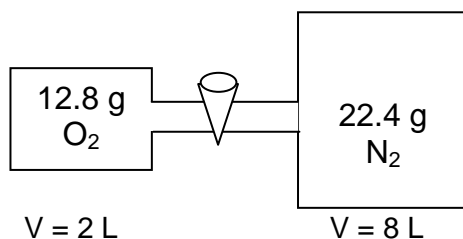


Answer the following questions on the basis of above write up.

15. How much gram of NaOH will be present in one litre of the test solution?
(A) 10 (B) 8
(C) 4 (D) 2
16. How much gram of Na_2CO_3 is present in one litre of the test solution?
(A) 5.3 (B) 10.6
(C) 21.2 (D) 2.65

Space For Rough Work

Paragraph for Question no. 17 to 18



Above system is maintained at 1000 K.

Answer the following questions.

17. How much gas will be transferred between the containers when the stop cock is opened?
 (A) 0.24 mole of O₂ gas will pass from smaller container to the larger container.
 (B) 0.16 mole of N₂ gas will pass from larger container to smaller container.
 (C) 0.24 mole of N₂ gas will pass from larger container to smaller container.
 (D) 0.16 mole of O₂ gas will pass from smaller container to the larger container.
18. What will be the pressure of the container after the stop cock is opened?
 (A) 8.925 atm (B) 9.852 atm
 (C) 8.529 atm (D) 9.258 atm

PART – B
(Numerical based)

- 0.01 mole of a compound (X) measures 800 mg. What is the molar mass of the compound in g mol⁻¹ unit?
- The volume of one molecule of a real gas is $0.5 \times 10^{-6} \text{ m}^3$. If the excluded volume of the molecule is expressed as $y \times 10^{-6} \text{ m}^3$. What is the value of y?
- A container contains equal mass of He and CH₄ gases at a certain temperature. If the partial pressure of helium is expressed as the simple ratio $\left(\frac{x}{y}\right) P_{\text{Total}}$, what is the sum of (x + y)?
 (P_{Total} is the total pressure produced in the container)
- The root mean square velocity of CH₄ at 400 K is equal to the most probable velocity of an unknown gas at 300 K. What is the molar mass of the unknown gas in g mol⁻¹ unit?
- How many electron(s) is/are present in the antibonding molecular orbitals of dioxygen molecule?

Space For Rough Work

SECTION-3 : MATHEMATICS

PART – A

(Multi Correct Choice Type)

This section contains 7 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which **ONE OR MORE** may be correct.

1. If $\frac{\sin^4 x}{2} + \frac{\cos^4 x}{3} = \frac{1}{5}$ then which of the following is/are correct?
- (A) $\tan^2 x = \frac{2}{3}$ (B) $\frac{\sin^8 x}{8} + \frac{\cos^8 x}{27} = \frac{1}{125}$
 (C) $\tan^2 x = \frac{1}{3}$ (D) $\frac{\sin^8 x}{8} + \frac{\cos^8 x}{27} = \frac{2}{125}$
2. Which of the following is/are INCORRECT?
- (A) $\lim_{x \rightarrow \pi} \frac{\sin x}{x} = 1$ (B) $\lim_{x \rightarrow \infty} \frac{\sin x}{x} = 1$
 (C) $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$ (D) $\lim_{x \rightarrow \pi} \frac{1 - \cos x}{x^2} = \frac{1}{2}$
3. If $x = \cos 10^\circ \cos 20^\circ \cos 40^\circ$, then x equals
- (A) $\frac{1}{4} \tan 10^\circ$ (B) $\frac{1}{8} \cot 10^\circ$
 (C) $\frac{1}{16} \sin 20^\circ \operatorname{cosec}^2 10^\circ$ (D) $\frac{1}{8} \sec 10^\circ$
4. If $x = \frac{e^t + e^{-t}}{2}$ and $y = \frac{e^t - e^{-t}}{2}$ then $\frac{dy}{dx}$ will be equal to
- (A) $\frac{e^t + e^{-t}}{e^t - e^{-t}}$ (B) $\frac{e^{2t} + 1}{e^{2t} - 1}$
 (C) $\frac{x}{y}$ (D) $\frac{y}{x}$
5. Which of the following, when simplified, reduces to unity?
- (A) $\log_{10} 5 \cdot \log_{10} 20 + (\log_{10} 2)^2$ (B) $\frac{2 \log_{10} 2 + \log_{10} 3}{\log_{10} 48 - \log_{10} 4}$
 (C) $-\log_5 \log_3 \sqrt{\sqrt{9}}$ (D) $\frac{1}{6} \log_{\frac{\sqrt{3}}{2}} \left(\frac{64}{27} \right)$

Space For Rough Work

6. The inequation $(x-1)(x-2)^2(x-3)^3(x-4)^4 < 0$ has
 (A) infinite positive integral solutions (B) infinite negative integral solutions
 (C) no positive integral solution (D) no negative integral solution
7. Centre of circle touching to y – axis at 3-unit distance from origin and cuts off an intercept of length 8 units on the x – axis is:
 (A) (5, 3) (B) (–5, 3)
 (C) (5, –3) (D) (–5, –3)

(Single Correct Choice Type)

This section contains **7 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct**.

8. The value of $6(\sin^6 \theta + \cos^6 \theta) - 9(\sin^4 \theta + \cos^4 \theta) + 4$ will be
 (A) –3 (B) 0
 (C) 1 (D) 3
9. The value of $\lim_{x \rightarrow \infty} \frac{\sin\left(\frac{3}{4^x}\right)}{\sin\left(\frac{4}{3^x}\right)}$ is equal to
 (A) $\frac{3}{4}$ (B) $\frac{4}{3}$
 (C) 0 (D) 1
10. There are two circles whose equation are $x^2 + y^2 = 9$ and $x^2 + y^2 - 8x - 6y + n^2 = 0$, $n \in \mathbb{Z}$. If the two circles have exactly two common tangents, then the number of possible values of n , is
 (A) 2 (B) 8
 (C) 9 (D) none of these
11. The line $\lambda x + \mu y = 1$ is a normal to the circle $2x^2 + 2y^2 - 5x + 6y - 1 = 0$ if
 (A) $5\lambda - 6\mu = 2$ (B) $4 + 5\mu = 6\lambda$
 (C) $4 + 6\mu = 5\lambda$ (D) none of these
12. If $y = a^{\sin x}$, then $\frac{dy}{dx}$ is equal to
 (A) $a^{\sin x} \log a$ (B) $a^{\sin x} \cos x \log a$
 (C) $a^{\cos x}$ (D) none of these

Space For Rough Work

13. $\int x^2 e^{x^3} \cos(e^{x^3}) dx =$
- (A) $3 \sin e^{x^3} + c$ (B) $\sin e^{x^3} c$
 (C) $\frac{1}{3} \sin e^{x^3} + c$ (D) $-\frac{1}{3} \sin e^{x^3} + c$
14. If $\tan \theta = -\frac{4}{3}$, then $\sin \theta$ will be
- (A) $-\frac{4}{5}$ but not $\frac{4}{5}$ (B) $-\frac{4}{5}$ or $\frac{4}{5}$
 (C) $\frac{4}{5}$ but not $-\frac{4}{5}$ (D) none of these

(Paragraph Type)

This section contains **2 paragraphs**. Based upon the paragraphs **2 multiple choice questions** have to be answered. Each of these questions has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

Paragraph for Question no. 15 to 16

Let image of point A (1, 2) in the line L = 0 is B (3, 8), then:

15. Equation of line L is:
- (A) $x + 3y - 17 = 0$ (B) $3x + y - 17 = 0$
 (C) $2x + 6y - 14 = 0$ (D) none of these
16. Foot of perpendicular drawn from origin to the line L will be:
- (A) $\left(\frac{17}{10}, \frac{51}{10}\right)$ (B) $\left(\frac{17}{10}, -\frac{51}{10}\right)$
 (C) $\left(-\frac{17}{10}, \frac{51}{10}\right)$ (D) none of these

Paragraph for Question no. 17 to 18

Consider the circle S: $x^2 + y^2 - 4x - 1 = 0$ and the line L: $y = 3x - 1$. If the line L cuts the circle at A and B, then

17. Length of the chord AB equals
- (A) $2\sqrt{5}$ (B) $\sqrt{5}$
 (C) $5\sqrt{2}$ (D) $\sqrt{10}$

Space For Rough Work

18. The angle subtended by the chord AB in the minor arc of S is
- (A) $\frac{3\pi}{4}$ (B) $\frac{5\pi}{6}$
(C) $\frac{2\pi}{3}$ (D) $\frac{\pi}{4}$

PART – B
(Numerical based)

1. If A(0,2) , B(3,2) and P is any point on x- axis then minimum value of AP + PB is.....
2. If the circle $x^2 + y^2 + 4x + 22y + c = 0$ bisects the circumference of the circle $x^2 + y^2 - 2x + 8y - d = 0$, then c + d is equal to
3. The value of $\frac{\sin 1^\circ + \sin 3^\circ + \sin 5^\circ + \sin 7^\circ}{\cos 1^\circ \cdot \cos 2^\circ \cdot \sin 4^\circ}$ is equal to
4. The value of $\log_{4\sqrt[4]{4}} \sqrt[3]{2^{40}}$ will be
5. If the slope of one of the lines given by $36x^2 + 2hxy + 72y^2 = 0$ is four times the other value, then $\frac{h^2}{2025}$ is equal to

Space For Rough Work

FIITJEE INTERNAL TEST

BATCHES: Two Year CRP(2224) C-lot_PAPER-1
PHASE TEST – I

PHYSICS, CHEMISTRY & MATHEMATICS

ANSWER KEY

Paper Code
100082

SECTION-1 : PHYSICS

PART – A

- | | | | |
|--------|-------|--------|-------|
| 1. BC | 2. AD | 3. ACD | 4. AD |
| 5. ABD | 6. AD | 7. ABC | 8. C |
| 9. B | 10. B | 11. B | 12. A |
| 13. A | 14. A | 15. A | 16. A |
| 17. A | 18. A | | |

PART – B

- | | | | |
|------|------|------|------|
| 1. 6 | 2. 0 | 3. 1 | 4. 2 |
| 5. 8 | | | |

SECTION – 2 : CHEMISTRY

PART – A

- | | | | |
|---------|--------|--------|--------|
| 1. ABCD | 2. ABD | 3. ABC | 4. ABD |
| 5. BCD | 6. AB | 7. AB | 8. B |
| 9. C | 10. A | 11. C | 12. C |
| 13. A | 14. C | 15. B | 16. B |
| 17. D | 18. B | | |

PART – B

- | | | | |
|-------|------|------|------|
| 1. 80 | 2. 2 | 3. 9 | 4. 8 |
| 5. 6 | | | |

SECTION – 3 : MATHEMATICS

PART – A

- | | | | |
|--------|--------|---------|--------|
| 1. AB | 2. ABD | 3. BC | 4. ABC |
| 5. ABC | 6. CD | 7. ABCD | 8. C |
| 9. C | 10. C | 11. C | 12. B |
| 13. C | 14. B | 15. A | 16. A |
| 17. D | 18. A | | |

PART – B

- | | | | |
|------|-------|------|------|
| 1. 5 | 2. 50 | 3. 4 | 4. 5 |
| 5. 2 | | | |