

FIITJEE - JEE (Main)

PHYSICS, CHEMISTRY & MATHEMATICS
BATCHES: PANINI426-XI & PANINI426-A1-A2
PHASE TEST – I
Q.P. CODE: 100714-0

Time Allotted: 3 Hours

Maximum Marks: 300

- Do not open this Test Booklet until you are asked to do so.
- Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

Important 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

- Attempt ALL the questions. Answers have to be marked on the OMR sheets.
- This question paper contains **Three Sections**.
- Section-I** is Physics, **Section-II** is Chemistry and **Section-III** is Mathematics.
- Each **Section** is further divided into **Two Parts: Part-A & B** in the OMR.
- Rough spaces are provided for rough work inside the question paper. No additional sheets will be provided for rough work.
- No candidate is allowed to carry any textual material, printed or written, bits of papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices ext. except the Admit Card inside the examination hall / room.

B. Filling of OMR Sheet:

- Ensure matching of OMR sheet with the Question paper before you start marking your answers on OMR sheet.
- On the OMR sheet, darken the appropriate bubble with **Blue/Black Ball Point Pen** for each character of your Enrolment No. and write in ink your Name, Test Centre and other details at the designated places.
- OMR sheet contains alphabets, numerals & special characters for marking answers.
- Do not fold or make any stray marks on the Answer Sheet.**

C. Marking Scheme for All Two Parts:

- Part-A (01-20)** – Contains Twenty (20) multiple choice objective questions which have four (4) options each and only one correct option. Each question carries **+4 marks** which will be awarded for every correct answer and **-1 mark** will be deducted for every incorrect answer.
- Part-B (01-05)** contains five (05) Numerical based questions, the answer of which maybe positive or negative numbers or decimals **Two decimal Places** (e.g. 6.25, 7.00, -0.33, -.30, 30.27, -127.30) and each question carries **+4 marks** for correct answer and **there will be no negative marking.**

Name of the Candidate : _____

Batch : _____ Date of Examination : _____

Enrolment Number : _____

Physics

PART – A

Straight Objective Type

This part contains **20 multiple choice questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

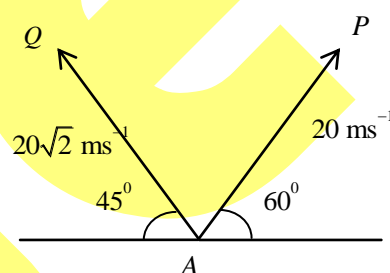
1. The length, width and thickness of a block are (100.0 ± 0.1) cm, (10.00 ± 0.01) cm and (1.000 ± 0.001) cm respectively. The maximum possible error in its volume will be
 (A) $\pm 0.111 \text{ cm}^3$ (B) $\pm 0.012 \text{ cm}^3$ (C) $+ 0.03 \text{ cm}^3$ (D) none of these

2. A particle moving with uniform acceleration along a straight line covers distances a and b in successive intervals of p and q seconds. The acceleration of the particle is

(A) $\frac{pq(p+q)}{2(bp-aq)}$ (B) $\frac{2(aq-bp)}{pq(p+q)}$ (C) $\frac{2(bp-aq)}{pq(p-q)}$ (D) $\frac{2(bp-aq)}{pq(p+q)}$

3. Two particles P and Q are projected simultaneously away from each other from a point A as shown in figure. The velocity of P relative to Q in ms^{-1} at the instant when the motion of P is horizontal is

(A) $10\sqrt{4-\sqrt{3}}$
 (B) $20\sqrt{4-\sqrt{3}}$
 (C) $10\sqrt{4+\sqrt{3}}$
 (D) $20\sqrt{4+\sqrt{3}}$



4. A projectile is given an initial velocity of $(\hat{i} + 2\hat{j})$ m/s, where \hat{i} is along the ground and \hat{j} is along the vertical. If $g = 10 \text{ m/s}^2$, the equation of its trajectory is:

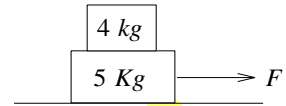
(A) $y = 2x - 5x^2$ (B) $4y = 2x - 5x^2$ (C) $4y = 2x - 25x^2$ (D) $y = x - 5x^2$

5. If the coefficient of friction between an insect and hemispherical bowl of radius r is μ , the maximum height to which the insect can crawl in the bowl is:

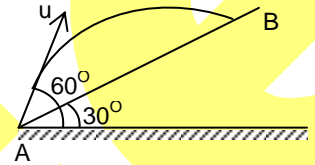
(A) $\frac{r}{\sqrt{1+\mu^2}}$ (B) $r \left[1 - \frac{1}{\sqrt{1+\mu^2}} \right]$ (C) $r\sqrt{1+\mu^2}$ (D) $r \left[\sqrt{1+\mu^2} - 1 \right]$

Space For Rough Work

6. The coefficient of friction between 4 kg and 5 kg blocks is 0.2 and between 5 kg block and ground is 0.1 respectively. Choose the correct statements.
 (A) Minimum force needed to cause system to move on ground is 17 N
 (B) When force $F = 4\text{N}$, static friction at all surfaces is 4 N to keep system at rest.
 (C) Maximum acceleration of 4 kg block is 2 m/s^2
 (D) Slipping between 4 kg and 5 kg block starts when F is 17 N.



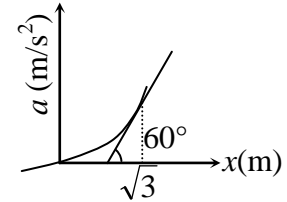
7. The time taken by the projectile to reach from A to B is t . Then the distance AB is equal to
 (A) $\frac{ut}{\sqrt{3}}$ (B) $\frac{\sqrt{3}}{2} ut$
 (C) $\sqrt{3} ut$ (D) $2 ut$



8. If $|\vec{A} \times \vec{B}| = \sqrt{3}(\vec{A} \cdot \vec{B})$, then the value of $|\vec{A} + \vec{B}|$ is
 (A) $(A^2 + B^2 + AB)^{1/2}$ (B) $(A^2 + B^2 + \frac{AB}{\sqrt{3}})^{1/2}$
 (C) $(A + B)$ (D) $(A^2 + B^2 + \sqrt{3} AB)^{1/2}$

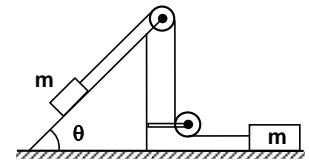
9. The dimensional formula of magnetic flux is ([A] is the dimensional formula of electric current)
 (A) $[ML^2T^{-2}A^{-1}]$ (B) $[ML^0T^{-2}A^{-2}]$ (C) $[M^0L^{-2}T^{-2}A^{-2}]$ (D) $[ML^2T^{-1}A^3]$

10. A particle starts moving with initial velocity of 3 m/s along x-axis from origin. Its acceleration is varying with position (x) in parabolic nature as shown in figure. A tangent to the graph is drawn at $x = \sqrt{3}\text{ m}$. The tangent makes an angle of 60° with the x-axis. At this position the velocity of particle is



- (A) $\sqrt{\sqrt{3} + 9}\text{ m/s}$ (B) $\sqrt{\sqrt{3} + 6}\text{ m/s}$ (C) $\sqrt{3}\text{ m/s}$ (D) $\sqrt{6}\text{ m/s}$

11. For the system shown in the figure, the pulleys are light and frictionless. Assume wedge to be fixed and smooth. The tension in the string will be
 (A) $\frac{2}{3} mg \sin \theta$ (B) $\frac{3}{4} mg \sin \theta$
 (C) $\frac{1}{2} mg \sin \theta$ (D) $mg \sin \theta$

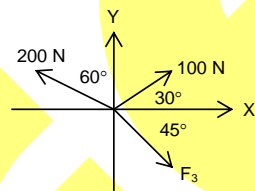


Space For Rough Work

12. Two full turns of the circular scale of a screw gauge cover a distance of 1 mm on its main scale. The total number of division on the circular scale is 50. Further, it is found that the screw gauge has a zero error of -0.03 mm. While measuring the diameter of a thin wire, a student notes the main scale reading of 3 mm and the number of circular scale divisions in line with the main scale as 35. The diameter of the wire is
 (A) 3.73 mm (B) 3.67 mm (C) 3.38 mm (D) 3.32 mm

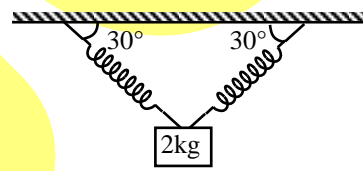
13. When three forces of 50N, 30N and 15N act on a body, then the body is
 (A) at rest (B) Moving with a uniform velocity
 (C) in equilibrium (D) Moving with an acceleration

14. If resultant of 3 forces is along Y-axis then F_3 is equal to
 (A) $100\sqrt{6}$ (B) $\frac{100\sqrt{3}}{2}$
 (C) $50\sqrt{6}$ (D) $100\sqrt{3}$



15. In a vernier callipers, one main scale division is x cm and n division of the vernier scale coincide with $(n - 1)$ divisions of the main scale. The least count (in cm) of the callipers is
 (A) $\left(\frac{n-1}{n}\right)x$ (B) $\frac{nx}{(n-1)}$ (C) $\frac{x}{n}$ (D) $\frac{x}{(n-1)}$

16. A block of mass 2 kg is hanging with two identical massless springs as shown in figure. The acceleration of the block just at the moment, the right spring breaks is ($g = 10$ m/s²)
 (A) 10 m/s² (B) 5 m/s² (C) 25 m/s² (D) 4 m/s²



17. The angles which a vector $\hat{i} + \hat{j} + \sqrt{2}\hat{k}$ makes with X, Y and Z axes respectively are
 (A) $60^\circ, 60^\circ, 60^\circ$ (B) $45^\circ, 45^\circ, 45^\circ$ (C) $60^\circ, 60^\circ, 45^\circ$ (D) $45^\circ, 45^\circ, 60^\circ$

18. Two vector \vec{A} and \vec{B} lie in a plane, another vector \vec{C} lies outside this plane, then the resultant of these three vectors i.e. $\vec{A} + \vec{B} + \vec{C}$
 (A) Can be Zero (B) Cannot be Zero
 (C) Lies in the plane containing $\vec{A} + \vec{B}$ (D) Lies in the plane containing $\vec{A} - \vec{B}$

Space For Rough Work

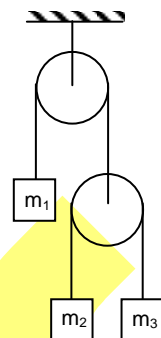
19. In the arrangement, shown below pulleys are massless and frictionless and threads are inextensible, block of mass m_1 will remain at rest if

(A) $\frac{4}{m_1} = \frac{1}{m_2} + \frac{1}{m_3}$

(B) $m_1 = m_2 = m_3$

(C) $\frac{1}{m_1} = \frac{1}{m_2} + \frac{1}{m_3}$

(D) $\frac{1}{m_3} = \frac{2}{m_2} + \frac{3}{m_1}$



20. The dimensions of $\frac{a}{b}$ in the equation $P = \frac{a - t^2}{bx}$, where P is pressure, x is distance and t is time, are

(A) $[M^2LT^{-3}]$

(B) $[MT^{-2}]$

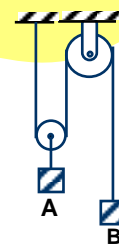
(C) $[LT^{-3}]$

(D) $[ML^3T^{-1}]$

PART-B
Numerical Type

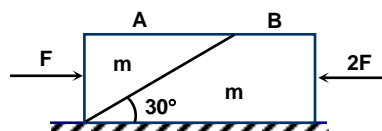
1. If $\vec{A} \cdot \vec{B} = |\vec{A} \times \vec{B}|$ and $|\vec{A}|$ & $|\vec{B}|$ are $2\sqrt{2}$ and 3 respectively, determine $|\vec{C}| = |\vec{A} \times \vec{B}|$.

2. Two blocks 'A' and 'B' having masses m_A and m_B , respectively, are connected by an arrangement shown in the figure. The acceleration of block B is found to be $k \times 4 \text{ m/s}^2$ when the acceleration of A is 2 m/s^2 . Then find 'k'.



3. Multiply 107.88 by 0.610 and express the result with proper regard to the significant figures.

4. Two blocks A and B each of mass m are placed on a smooth horizontal surface. Two horizontal force F and 2F are applied on both the blocks A and B, respectively, as shown in the figure. If the block A does not slide on block B, then the normal reaction acting between the two blocks is found to be $n \times F$. Then n is



5. The length of a pendulum is measured as 20.0 cm. The time interval for 100 oscillations is measured as 80 s with a stop watch of 1 s resolution. Find the accuracy in the determination of g in percentage.

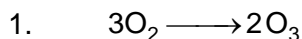
Space For Rough Work

Chemistry

PART – A

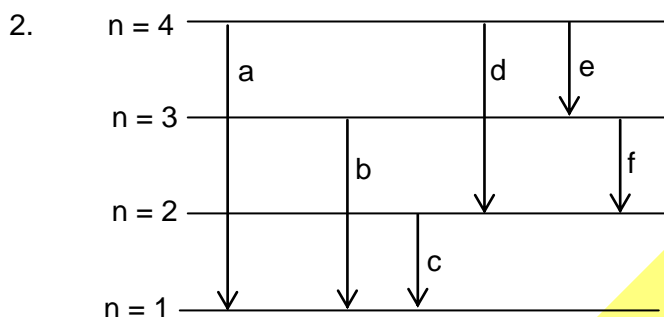
Straight Objective Type

This part contains **20 multiple choice questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.



How much ozone(O_3) is produced by complete reaction of one mole of dioxygen(O_2)?

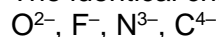
- (A) 72g (B) 48g (C) 32g (D) 24g



Electron transitions from higher to lower energy states of hydrogen atoms are given above. All radiations are represented by letters like a, b, etc. The order of energy of the radiations is

- (A) $a > d > b > c > f > e$ (B) $a > b > d > c > f > e$
 (C) $a > b > d > c = f = e$ (D) $a > d > b > c = f = e$

3. The identical characteristics of the species given below is



- (A) nuclear charge(Z) (B) effective nuclear charge(Z^*)
 (C) Shielding constant(σ) (D) electron to proton ratio $\left(\frac{e}{p}\right)$

4.

A	B	C	D	E
P	Q	R	S	T
U	V	W	X	Y
G	H	I	J	K

Above elements are a part of periodic table and are called the main group elements(non-transition elements). No one is an inert-gas. The properties of the elements regularly vary in the group as well as period.

Choose the correct statement.

- (A) $P < Q < R < S < T$ (Order of atomic size)
 (B) $C < R < W < I$ (Order of first ionization energy)
 (C) $A < P < U < G$ (Order of nuclear charge)
 (D) $U < W < V < X < Y$ (Order of electronegativity)

Space For Rough Work

5. $I_2 + S_2O_3^{2-} \longrightarrow I^- + S_4O_6^{2-}$
Which species has(ve) identical value of n-factor?
(A) $I_2, S_2O_3^{2-}$ (B) $S_2O_3^{2-}, S_4O_6^{2-}$ (C) $I^-, S_2O_3^{2-}$ (D) $S_4O_6^{2-}, I^-$
6. The radial wave function of an atomic orbital may be
(A) $\psi_{2,3}$ (B) $\psi_{2,-1}$ (C) $\psi_{1,2}$ (D) $\psi_{3,1}$
7. $AO_2 + A_2O \longrightarrow 3AO$
If M is the molar mass of AO, then it's equivalent mass will be:
(A) $\frac{M}{2}$ (B) $\frac{2M}{3}$ (C) $\frac{3M}{2}$ (D) $\frac{M}{3}$
8. $PbO_2(aq) + 4HCl(aq) \longrightarrow PbCl_2(aq) + Cl_2(g) + 2H_2O(l)$
Choose correct statement
(A) chlorine is oxidized as well as reduced
(B) n-factor of HCl is one
(C) if one mole of PbO_2 completely reacts with one mole of HCl, 0.25 mole of a gas is produced
(D) the oxidation number of lead changes from +2 to +4
9. In a photoelectric experiment, the
Work function = 'a' eV
Kinetic energy of electrons = 'b' eV
Energy of incident radiation = 'c' eV
Ionization energy of metal = 'd' eV
Which relation is correct?
(A) $a + b = c$ (B) $b > d$ (C) $a + b + c = d$ (D) $b > c$
10. In which option, both the compounds react with NaOH?
(A) SO_2 and CaO (B) BaO and BeO (C) Cl_2O_7 and BeO (D) Cl_2O_7 and CaO
11. The wave function ψ is a function of
(A) mass of electron (B) coordinate of electron
(C) charge of electron (D) spin motion of electron
12. How many electrons are present in 1.8 g water?
(A) 6.022×10^{23} (B) 6.022×10^{24} (C) 6.022×10^{22} (D) 6.022×10^{25}
13. Which order is correct for nitrogen and oxygen?
(A) First ionization energy: $O > N$ (B) Electron affinity: $N > O$
(C) Second ionization energy: $O > N$ (D) Electronegativity: $N > O$

Space For Rough Work

14. Which are the principal and azimuthal quantum numbers of an atomic orbital which has two radial nodes and two angular nodes?
 (A) $n = 4, \ell = 1$ (B) $n = 3, \ell = 2$ (C) $n = 4, \ell = 2$ (D) $n = 5, \ell = 2$
15. The oxidation number of chlorine in HClO_3 is
 (A) +3 (B) +5 (C) +7 (D) +1
16. In which option both orbitals have different type of nodal surface?
 [Assume that $m_\ell = 0$ along z-axis]
 (A) (i) $n = 3, \ell = 1, m_\ell = -1$ (B) (i) $n = 4, \ell = 2, m_\ell = +1$
 (ii) $n = 4, \ell = 1, m_\ell = 0$ (ii) $n = 4, \ell = 2, m_\ell = -1$
 (C) (i) $n = 3, \ell = 2, m_\ell = 0$ (D) (i) $n = 2, \ell = 1, m_\ell = 0$
 (ii) $n = 4, \ell = 2, m_\ell = +2$ (ii) $n = 2, \ell = 1, m_\ell = +1$
17. $\text{K}_2\text{S} + 2\text{O}_2 \longrightarrow \text{K}_2\text{SO}_4$
 What is the equivalent mass of K_2S (molar mass = M)?
 (A) $\frac{M}{12}$ (B) $\frac{M}{6}$ (C) $\frac{M}{8}$ (D) $\frac{M}{10}$
18. The exchange energy becomes identical for
 (A) p^4 and d^6 electronic configuration (B) p^6 and f^3 electronic configuration
 (C) p^6 and d^4 electronic configuration (D) d^6 and f^4 electronic configuration
19. $\text{S} + \text{O}_2 \longrightarrow \text{SO}_2$
 In above reaction one mole each of sulphur and oxygen produces 60 g of SO_2 . What is percentage (w/w) yield of product?
 (A) 84.24% (B) 86% (C) 93.75% (D) 90.4%
20. What does the term $(2n + 1)a_0$ represent in Bohr's theory of hydrogen atoms?
 n = Principal quantum number
 a_0 = radius of the first orbit of hydrogen atom
 (A) the difference in frequency of n^{th} and $(n + 1)^{\text{th}}$ orbit
 (B) the difference in radius of n^{th} and $(n + 1)^{\text{th}}$ orbit
 (C) the difference in perimeter of the n^{th} and $(n + 1)^{\text{th}}$ orbit
 (D) the difference in area of n^{th} and $(n + 1)^{\text{th}}$ orbit

Space For Rough Work

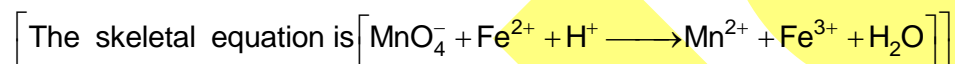
PART-B
Numerical Type

1. If the oxidation number of sulfur in $\text{Na}_2\text{S}_4\text{O}_6$ is +x, what is the value of 'x'?
2. A hydrated salt $\text{Mg}(\text{OH})_2 \cdot x\text{H}_2\text{O}$ contains 10.08% of magnesium. What is the molar mass of the hydrated salt?
3. The electronegativity of an atom is 3.1 in Mulliken scale. If its ionization energy ($I.E_1$) is 3.4 eV, what will be its electron affinity in eV unit?

4.
$$\psi_{2s} = \frac{1}{2\sqrt{2}} \left(\frac{Z}{a_0} \right)^{3/2} \left(2 - \frac{Zr}{a_0} \right) e^{-\frac{Zr}{2a_0}}$$

The value of a_0 is 0.53 \AA . The wave function of the 2s orbital of hydrogen atom is given above. If the radial distribution function of the orbital becomes zero at a point which is $x \text{ \AA}$ away from the nucleus of the atom, what is the value of x?

5. 400 mL of 3.75 M acidified KMnO_4 solution completely oxidizes 'x' mole of Fe^{2+} ions to Fe^{3+} ions. What is the value of 'x'?



Space For Rough Work

Mathematics

PART – A

Straight Objective Type

This part contains **20 multiple choice questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

- The value of $2 \tan \frac{\pi}{10} + 3 \sec \frac{\pi}{10} - 4 \cos \frac{\pi}{10}$ is
 (A) 0 (B) $\sqrt{5}$ (C) 1 (D) None of these
- The value of $\cos 12^\circ \cdot \cos 24^\circ \cdot \cos 36^\circ \cdot \cos 48^\circ \cdot \cos 72^\circ \cdot \cos 84^\circ$ is
 (A) $\frac{1}{64}$ (B) $\frac{1}{32}$ (C) $\frac{1}{16}$ (D) $\frac{1}{128}$
- The value of $\sin 78^\circ - \sin 66^\circ - \sin 42^\circ + \sin 6^\circ$ is
 (A) $\frac{1}{2}$ (B) $-\frac{1}{2}$ (C) -1 (D) None of these
- Given $A = \sin^2 \theta + \cos^4 \theta$, then for all real value of θ :
 (A) $1 \leq A \leq 2$ (B) $\frac{3}{4} \leq A \leq 1$ (C) $\frac{13}{16} \leq A \leq 1$ (D) $\frac{1}{4} \leq A \leq \frac{3}{4}$
- If θ lies in the first quadrant and $\cos \theta = \frac{8}{17}$, then the value of $\cos(30^\circ + \theta) + \cos(45^\circ - \theta) + \cos(120^\circ - \theta)$ is
 (A) $\left(\frac{\sqrt{3}-1}{2} + \frac{1}{\sqrt{2}}\right) \frac{23}{17}$ (B) $\left(\frac{\sqrt{3}+1}{2} + \frac{1}{\sqrt{2}}\right) \frac{23}{17}$
 (C) $\left(\frac{\sqrt{3}-1}{2} - \frac{1}{\sqrt{2}}\right) \frac{23}{17}$ (D) $\left(\frac{\sqrt{3}+1}{2} - \frac{1}{\sqrt{2}}\right) \frac{23}{17}$
- The solution set of the equation $|2x + 3| - |x - 1| = 6$, is
 (A) $x \in (-10, 2)$ (B) $x \in [-10, 2)$ (C) $x \in [-10, 2]$ (D) $x \in (-10, 2]$
- The value of $81^{\left(\frac{1}{\log_5 3}\right)} + 27^{\log_9 36} + 3^{\frac{4}{\log_7 9}}$
 (A) 49 (B) 625 (C) 216 (D) 890

Space For Rough Work

8. Set of values of x satisfying the inequality $\frac{(x-3)^2(2x+5)^2(x-7)}{(x^2+x+1)(3x+6)^2} \leq 0$ is $[a, b) \cup (b, c]$ then $2a+b+c$ is equal to
 (A) 0 (B) 2 (C) 5 (D) 7
9. The number of positive integral solutions of the inequaiton $\frac{x^2(3x-4)^3(x-2)^4}{(x-5)^5(2x-7)^6} \leq 0$ is
 (A) 2 (B) 0 (C) 3 (D) 4
10. If $|x-1|+|x-2|+|x-3| \geq 6$ then
 (A) $0 \leq x \leq 4$ (B) $x \leq -2$ or $x \geq 4$ (C) $x \leq 0$ or $x \geq 4$ (D) None of these
11. The set of real values of x satisfying $||x-1|-1| \leq 1$ is
 (A) $[-1, 3]$ (B) $[0, 2]$ (C) $[-1, 1]$ (D) None of these
12. The solution of the inequation $\log_{0.1} \left(\log_2 \frac{x^2+1}{|x-1|} \right) < 0$ lies in the interval
 (A) $(1, \infty)$ (B) $(-\infty, 1)$ (C) $[1, \infty)$ (D) None of these
13. The equation, $\log_2(2x^2) + \log_2 x \cdot x^{\log_x(\log_2 x+1)} + \frac{1}{2} \log_4^2(x^4) + 2^{-3 \log_{1/2}(\log_2 x)} = 1$ has
 (A) exactly one real solution (B) two real solutions
 (C) 3 real solutions (D) no solution
14. Let $x_1 = 97, x_2 = \frac{2}{x_1}, x_3 = \frac{3}{x_2}, x_4 = \frac{4}{x_3}, \dots, x_8 = \frac{8}{x_7}$ then $\log_{3\sqrt{2}} \left(\prod_{i=1}^8 x_i - 60 \right) =$
 (A) $\frac{3}{2}$ (B) 4 (C) 6 (D) $\frac{5}{2}$
15. Differentiation of $\frac{x^3}{\cos x}$ w.r.t. x , is
 (A) $\frac{3x^2 \cos x + x^3 \sin x}{\cos^2 x}$ (B) $\frac{3x^2 \sin x + x^3 \cos x}{\cos^2 x}$
 (C) $\frac{x^3 \cos x - 3x^2 \sin x}{\cos^2 x}$ (D) $\frac{x^3 \sin x - 3x^2 \cos x}{\cos x}$

Space For Rough Work

16. $\int \sqrt{x}e^{\sqrt{x}} dx$ is equal to
 (A) $2\sqrt{x} - e^{\sqrt{x}} - 4\sqrt{x}e^{\sqrt{x}}$ (B) $(2x - 4\sqrt{x} + 4)e^{\sqrt{x}}$
 (C) $(1 - 4\sqrt{x})e^{\sqrt{x}}$ (D) none of these
17. The maximum value of $\frac{\log x}{x}, x > 1$, is
 (A) e (B) $-e$ (C) $\frac{1}{e}$ (D) none of these
18. Equation of the tangent to the curve $y = e^{xy} - x$ at $(1, 0)$ is
 (A) $x = 1$ (B) $y = 0$ (C) $y = 1$ (D) $x = -1$
19. $\int_0^3 |(x-1)(x-2)| dx$ is equal to
 (A) $\frac{5}{6}$ (B) $\frac{7}{6}$ (C) $\frac{11}{6}$ (D) $\frac{13}{6}$
20. In a survey, it is found that 21 people read English newspaper, 26 people read Hindi newspaper, and 29 people read regional language newspaper. If 14 people read both English and Hindi newspaper; 15 people read both Hindi and regional language newspaper; 12 people read both English and regional language newspaper and 8 read all types of newspapers. How many people read only regional language newspaper?
 (A) 3 (B) 5 (C) 10 (D) None of these

Space For Rough Work

PART-B
Numerical Type

1. If $\cot \frac{\pi}{24} = \sqrt{p} + \sqrt{q} + \sqrt{r} + \sqrt{s}$ where $p, q, r, s \in \mathbb{N}$ and $p < q < r < s$ then $p+q+r+s$ _____
2. If $15\sin^4 \alpha + 10\cos^4 \alpha = 6$, then value of $8\operatorname{cosec}^6 \alpha + 27\sec^6 \alpha - 241$ is _____
3. The value of $\int_2^4 \frac{(\sqrt{x}+1)(x^2-\sqrt{x})}{x\sqrt{x}+x+\sqrt{x}} dx$ is _____
4. Sum of integer solutions of the inequality $(\log_3 x)^3 - 4(\log_3 x)^2 + 5(\log_3 x) - 6 < 0$ is _____
5. The number of integer values of m for which the y coordinate of the point of intersection of the line $3x + 2y = 10$ and $x = my + 2$ is also an integer is _____

Space For Rough Work

FIITJEE INTERNAL TEST

BATCHES: PANINI426-XI & PANINI426-A1-A2_PT1

PHYSICS, CHEMISTRY & MATHEMATICS

JEE MAIN-PHASE

Paper Code
100714-0

ANSWER KEY

SECTION – I

(PHYSICS)

PART – A

- | | | | |
|-------|-------|-------|-------|
| 1. D | 2. D | 3. B | 4. A |
| 5. B | 6. C | 7. A | 8. A |
| 9. A | 10. A | 11. C | 12. C |
| 13. D | 14. C | 15. C | 16. A |
| 17. C | 18. B | 19. A | 20. B |

PART – B

- | | | | |
|------|------|---------|------|
| 1. 6 | 2. 1 | 3. 65.9 | 4. 3 |
| 5. 3 | | | |

SECTION – II

(CHEMISTRY)

PART – A

- | | | | |
|-------|-------|-------|-------|
| 1. C | 2. B | 3. C | 4. C |
| 5. C | 6. D | 7. C | 8. C |
| 9. A | 10. C | 11. B | 12. A |
| 13. C | 14. D | 15. B | 16. C |
| 17. C | 18. C | 19. C | 20. B |

PART – B

- | | | |
|---------|--------------------------------|--------|
| 1. 2.5 | 2. 238.09(Range: 238 to 238.2) | 3. 2.8 |
| 4. 1.06 | 5. 7.5 | |

SECTION – III (MATHEMATICS)

PART – A

- | | | | |
|-------|-------|-------|-------|
| 1. A | 2. A | 3. B | 4. B |
| 5. A | 6. C | 7. D | 8. A |
| 9. C | 10. C | 11. C | 12. A |
| 13. D | 14. B | 15. A | 16. B |
| 17. C | 18. A | 19. C | 20. C |

PART – B

- | | | | |
|------|------|------|--------|
| 1. 3 | 2. 9 | 3. 4 | 4. 351 |
| 5. 3 | | | |