FIITJEE INTERNAL Phase Test

BATCHES – PANINI426-G1 & PANINI426XII-1_PT-7

PHYSICS, CHEMISTRY & MATHEMATICS

QP CODE: 101114 **Paper-1**

Time Allotted: 3 Hours **Maximum Marks: 180**

- 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. All the section can be filled in **PART-A & B** of 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 ***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.
3. OMR sheet contains alphabets, numerals & special characters for marking answers.

C. Marking Scheme For All Two Parts.

(i) **Part-A (01-04) –** Contains Four (04) multiple choice questions which have ONLY ONE CORRECT answer Each question carries **+3 marks** for correct answer and **-1 marks** for wrong answer.

(ii) **PART–A** (**05–07)** contains (**3**) Multiple Choice Questions which have **One or More Than One Correct** answer.
Full Marks: **+4** 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 **+4 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.

(iii) **Part-A (08-10) –** This section contains Three (03) Matching List Sets. Each set has **ONE** Multiple Choice Question. Each set has **TWO** lists: **List-I** and **List-II**. **List-I** has **Four** entries (P), (Q), (R) and (S) and **List-II** has **Five** entries (1), (2), (3), (4) and (5). **FOUR** options are given in each Multiple Choice Question based on **List-I** and **List-II** and **ONLY ONE** of these four options satisfies the condition asked in the Multiple Choice Question. Each question carries **+4 Marks** for correct answer and **-1 marks** for wrong answer.

(iii) **Part-B –** This section contains **SIX (06)** questions numerical based questions. The answer to each question is a **NUMERICAL VALUE.** If the numerical value has more than two decimal places, truncate/round-off the value to **TWO** decimal places. Each question carries **+4 marks** for correct answer. **There is no negative marking.**

Name of the Candidate: _____

Batch: _____ **Date of Examination:** _____

Enrolment Number: _____

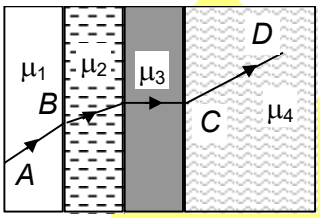
SECTION – I: PHYSICS

(PART – A)

(Single Correct Answer Type)

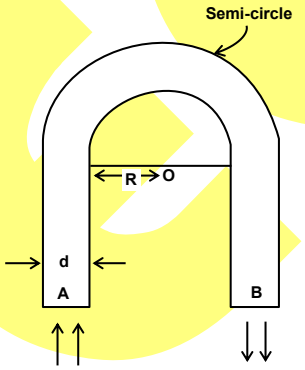
This section contains **4 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct.**

1. A ray of light passes through four transparent media with refractive indices μ_1, μ_2, μ_3 and μ_4 as shown in the figure. The surface of all media are parallel. If the emergent ray CD is parallel to the incident ray AB, then



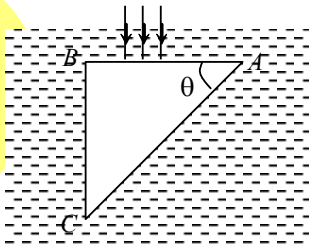
(A) $\mu_1 = \mu_2$ (B) $\mu_2 = \mu_3$
(C) $\mu_3 = \mu_4$ (D) $\mu_4 = \mu_1$

2. A glass rod (μ = 1.5) of square cross-section is bent into the shape shown in the figure. A parallel beam of light falls perpendicularly on the plane flat surface A. Referring to the diagram, d is the width of a side and R is the radius of inner semi-circle. The maximum value of ratio (d/R) so that all light entering the glass through surface A emerge from the glass through surface B is



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

3. A glass prism of refractive index 1.5 is immersed in water (μ = 4/3). A light beam incident normally on the face AB is totally reflected to reach the face BC, if



(A) $\sin\theta \geq \frac{8}{9}$ (B) $\sin\theta \leq \frac{2}{3}$ (C) $\sin\theta = \frac{4}{5}$ (D) $\frac{2}{3} < \sin\theta < \frac{8}{9}$

4. An object and its real image are located at distance 20 cm and 80 cm respectively from the two principal foci of a lens. Find the linear magnification of the image.
(A) m = –14/8 (B) m = –3/2
(C) m = –13/7 (D) m = –2

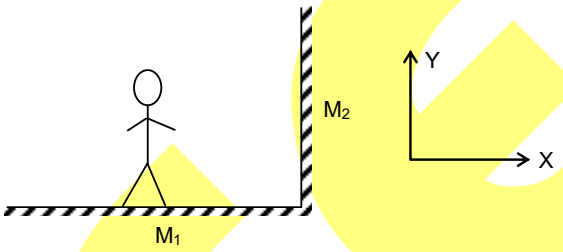
Space For Rough Work

(One or More Than One Options Correct Type)

This section contains **3 multiple choice questions.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONE** or **MORE THAN ONE is correct.**

5. A concave mirror may form
(A) virtual image of virtual object (B) virtual image of a real object
(C) real image of real object (D) real image of a virtual object

6. A man stands on a flat mirror M_1 in front of another plane mirror M_2,
(A) if M_1 moves along x-axis then images do not move.
(B) if M_2 moves along y-axis then images do not move
(C) if M_2 moves parallel to x-axis images do not move
(D) total number of virtual images formed is three



7. A converging lens is used to form an image on a screen. When the upper half of the lens is covered by an opaque screen,
(A) half the image will disappear. (B) complete image will be formed.
(C) intensity of the image will increase (D) intensity of the image will decrease.

(Matching List Sets)

This section contains **Three (03)** Matching List Sets. Each set has **ONE** Multiple Choice Question. Each set has **TWO** lists: **List-I** and **List-II**. **List-I** has **Four** entries (P), (Q), (R) and (S) and **List-II** has **Five** entries (1), (2), (3), (4) and (5). **FOUR** options are given in each Multiple Choice Question based on **List-I** and **List-II** and **ONLY ONE** of these four options satisfies the condition asked in the Multiple Choice Question.

8. A thin prism of angle 6°, $\omega = 0.07$ and $\mu_y = 1.5$ IS combined with another thin prism having $\omega = 0.08$ and $\mu_y = 1.60$. The combination produces no deviation in the mean ray, then match the following

List – I		List – II	
(P)	The angle of second prism	(1)	0.03°
(Q)	Net angular dispersion produced by the combination when a beam of white light passes through it.	(2)	6°
(R)	If the prisms are similarly directed then the deviation in the mean ray will be	(3)	0.45°
(S)	The angular dispersion in the situation described in C	(4)	5°

The correct option is
(A) P – 4, Q – 1, R – 3, S – 2 (B) P – 4, Q – 3, R – 1, S – 2
(C) P – 4, Q – 1, R – 2, S – 3 (D) P – 2, Q – 3, R – 4, S – 1

Space For Rough Work

9. An optical instrument is made using four different mirror or lens but radius of curvature of each is R and refractive index of material of lens (μ) is 1.5. List-I gives the four different optical instruement (mirror / lens) and list-II of some quantity.

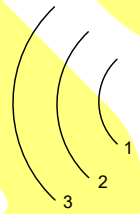
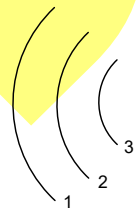
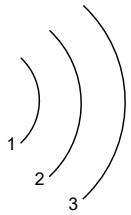
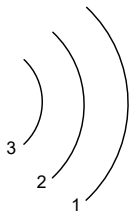
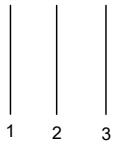
List-I		List-II	
(P)	Convex mirror	(1)	1
(Q)	Concave mirror	(2)	–1
(R)	Convex lens	(3)	2
(S)	Concave lens	(4)	–2
		(5)	–2/3

If the focal length of convex mirror is R/2 then the correct match for their focal length in terms of R/2.

(A) P $\rightarrow$ 1 ; Q $\rightarrow$ 2 ; R $\rightarrow$ 3 ; S $\rightarrow$ 4 (B) P $\rightarrow$ 4 ; Q $\rightarrow$ 3 ; R $\rightarrow$ 2 ; S $\rightarrow$ 1

(C) P $\rightarrow$ 3 ; Q $\rightarrow$ 2 ; R $\rightarrow$ 4 ; S $\rightarrow$ 1 (D) P $\rightarrow$ 1 ; Q $\rightarrow$ 4 ; R $\rightarrow$ 2 ; S $\rightarrow$ 3

10. A light beam is incident on a mirror or lens from left to right as given in List-I. The shape of wavefronts of reflected or refracted light is shown in list-II where light is travelling from wavefront 1 to 2 to 3.

List-I		List-II	
(P)	Convex mirror	(1)	
(Q)	Concave mirror	(2)	
(R)	Convex lens	(3)	
(S)	Concave lens	(4)	
		(5)	

If a parallel light beam is incident from left to right on the mirror or lens as given in list-I, then match the shape of wavefront obtained for the reflected/refracted light given in List-II.

(A) P $\rightarrow$ 4 ; Q $\rightarrow$ 1 ; R $\rightarrow$ 5 ; S $\rightarrow$ 2 (B) P $\rightarrow$ 1 ; Q $\rightarrow$ 4 ; R $\rightarrow$ 2 ; S $\rightarrow$ 3

(C) P $\rightarrow$ 2 ; Q $\rightarrow$ 3 ; R $\rightarrow$ 1 ; S $\rightarrow$ 4 (D) P $\rightarrow$ 3 ; Q $\rightarrow$ 5 ; R $\rightarrow$ 4 ; S $\rightarrow$ 1

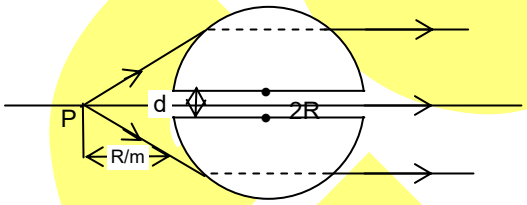
(PART – B)

This section contains **SIX (06)** numerical based questions. The answer to each question is a NUMERICAL VALUE. If the numerical value has more than two decimal places, truncate/round-off the value to TWO decimal places.

1. A concave mirror of focal length 10 cm and a convex mirror of focal length 15 cm are placed facing each other 40 cm apart. A point object is placed between the mirrors, on their common axis and 15 cm from the concave mirror. Find the distance (in cm) between image and convex mirror. If the image produced by the successive reflections, first at concave mirror and then at convex mirror.

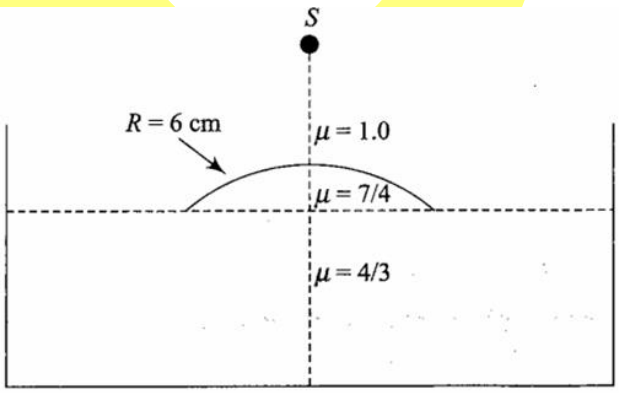
2. A point source S located on a wall. A plane mirror M having length l is moving parallel to the wall with constant velocity 1 m/s. The bright patch formed on the wall by reflected light will move with velocity v . Find v in m/s

3. Two hemisphere of diameter 2 R are placed as shown in the figure at separation 'd' between their flat surfaces. For what values of m the emergent rays are parallel to each other and to the principal axis. (d < < R/2m)



4. A large glass slab (μ = 5/3) of thickness 8 cm is placed over a point source of light on a plane surface. It is seen that light emerges out of the top surface of the slab from a circular area of radius R cm. What is the value of R?

5. Water (with refractive index = 4/3) in a tank is 18 cm deep. Oil of refractive index 7/4 lies on water making a convex surface of radius of curvature 'R = 6 cm' as shown. Consider oil to act as a thin lens. An object 'S' is placed 24 cm above water surface. The location of its image is at 'x' meter above the bottom of the tank. Then 'x' is:



6. A spot is placed on the bottom of a slab made of transparent material of refractive index 1.5. The spot is viewed vertically from the top when it seems to be raised by 2.1 cm. Then the height of the slab is $\frac{x}{10}$ cm. Find the value of 'x'.

Space For Rough Work

SECTION – II: CHEMISTRY

(PART – A)

(Single Correct Answer Type)

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

1. The emf of a hydrogen electrode is 0.1182 V. If the electrode is used as anode, what will be the pH of the H^+ solution?
   (A) 4 (B) 3
   (C) 2 (D) 1

2. What is the spin-only magnetic moment of Fe^{3+} ion?
   (A) $\sqrt{30}$ B.M (B) $\sqrt{35}$ B.M
   (C) $\sqrt{15}$ B.M (D) $\sqrt{20}$ B.M

3. How many coordination isomer(s) is/are possible for the following complex?
   $[Cr(NH_3)_6]\,[Co(CN)_6]$
   (A) 3 (B) 6
   (C) 5 (D) 7

4. Which of the following reagent cannot dissolve $Al(OH)_3$?
   (A) HCl (B) NaOH
   (C) NH_4OH (D) H_2SO_4

(One or More Than One Options Correct Type)

This section contains **3 multiple choice questions.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONE** or **MORE THAN ONE is correct.**

5. $Zn \mid Zn^{2+}(1\ M) \parallel Cu^{2+}(1\ M) \mid Cu$
   Which of the following statement(s) is/are correct for the above electrochemical cell?
   (A) $E_{cell} > 0$ (B) $E^0_{cell} > 0$
   (C) $E_{cell} = E^0_{cell}$ (D) $E_{cell} > E^0_{cell}$

6. Which of the following ion(s) do(es) not form coloured salts due to absence of d-d transition?
   (A) Ti^{4+} (B) Cu^+
   (C) Cr^{2+} (D) Fe^{2+}

7. Which of the following complex(es) display(s) linkage isomerism?
   (A) $[Cr(NH_3)_5(CN)]Cl_2$ (B) $[Cr(NH_3)_5(NO_2)]Cl_2$
   (C) $[Co_2(CO)_8]$ (D) $[ZnCl_4]^{2-}$

Space For Rough Work

(Matching List Sets)

This section contains **Three (03)** Matching List Sets. Each set has **ONE** Multiple Choice Question. Each set has **TWO** lists: **List-I** and **List-II**. **List-I** has **Four** entries (P), (Q), (R) and (S) and **List-II** has **Five** entries (1), (2), (3), (4) and (5). **FOUR** options are given in each Multiple Choice Question based on **List-I** and **List-II** and **ONLY ONE** of these four options satisfies the condition asked in the Multiple Choice Question.

8. Match the different types of conductance's and cell parameters mentioned in List - I with their factors mentioned in List - II

List – I		List – II	
(P)	Specific conductance	(1)	Depends on concentration of solution
(Q)	Molar conductance	(2)	Depends on temperature
(R)	Equivalent conductance	(3)	Decreases on dilution
(S)	Cell constant	(4)	Independent of conc. and temperature
		(5)	Increase on dilution

(A) (P) → (1, 2, 3), (Q) → (1, 2, 5), (R) → (1, 2, 5), (S) → (4)
(B) (P) → (1, 3), (Q) → (2, 4, 5), (R) → (1, 2), (S) → (4, 5)
(C) (P) → (1, 3), (Q) → (1, 4), (R) → (1, 2, 3, 5), (S) → (4)
(D) (P) → (2, 3), (Q) → (2, 5), (R) → (1, 3), (S) → (4)

9. Match the complexes mentioned in List - I with their properties mentioned in List – II.

List – I		List – II	
(P)	$[Fe(CN)_6]^{4-}$	(1)	Diamagnetic
(Q)	$[FeCl_4]^{-}$	(2)	Paramagnetic
(R)	$[FeF_6]^{3-}$	(3)	Oxidation number of iron is +2
(S)	$[Fe(CO)_5]$	(4)	Oxidation number of iron is zero
		(5)	Contains t_{2g}^6 configuration

(A) (P) → (2), (Q) → (3, 4), (R) → (2, 3), (S) → (1, 2)
(B) (P) → (1, 3, 5), (Q) → (2), (R) → (2), (S) → (1, 4)
(C) (P) → (1, 2), (Q) → (1, 3), (R) → (3, 4), (S) → (1, 4)
(D) (P) → (4), (Q) → (3, 5), (R) → (1, 3), (S) → (1)

10. Match the elements mentioned in List-I with their properties mentioned in List-II.

List – I		List – II	
(P)	Cr	(1)	Forms complexes with using more than one oxidation state
(Q)	Mn	(2)	Form coloured complexes through d-d transition
(R)	Zn	(3)	Lowest melting metal in the 3d series
(S)	Fe	(4)	Forms more than one oxide
		(5)	CFSE (Crystal field stabilization energy) is zero for complex with any ligand in +2 oxidation state

(A) (P) → (1, 2, 4), (Q) → (1, 2), (R) → (3, 5), (S) → (1, 2, 4)
(B) (P) → (2, 3, 4), (Q) → (1, 3, 4), (R) → (1, 4), (S) → (1, 2, 5)
(C) (P) → (1, 3, 5), (Q) → (1, 2, 4), (R) → (2, 3), (S) → (1, 3, 5)
(D) (P) → (1, 2, 3), (Q) → (3, 4, 5), (R) → (1, 5), (S) → (2, 3, 4)

Space For Rough Work

(PART – B)

This section contains **SIX (06)** numerical based questions. The answer to each question is a NUMERICAL VALUE. If the numerical value has more than two decimal places, truncate/round-off the value to TWO decimal places.

1. If the ratio of molar conductance at infinite dilution $\left(\Lambda_m^0\right)$ to equivalent conductance at infinite dilution $\left(\Lambda_e^0\right)$ of $Al_2(SO_4)_3$ is expressed as x : y, the value of x + y is:

2. How many 3d transition series metal(s) has/have half-filled d-orbitals configuration?

3. How many ionization isomer(s) is/are possible for the octahedral complex with formula $Cr(H_2O)_4ClBrI$?

4. How many moles of phenylhydrazine is required to form one mole of glucosazone?

5. What is the total number of oxygen atoms present in the two monomers of the polymer glyptal?

6. How many total number of atoms are present in the simplest α-amino acid which contains one chiral carbon atom?

Space For Rough Work

SECTION – III: MATHEMATICS

(PART – A)

(Single Correct Answer Type)

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

1. If A is a square matrix of order 2 such that $A\begin{bmatrix}1\\-1\end{bmatrix}=\begin{bmatrix}-1\\2\end{bmatrix}$ and $A^2\begin{bmatrix}1\\-1\end{bmatrix}=\begin{bmatrix}1\\0\end{bmatrix}$. The sum of elements and product of elements of A are S and P, then $S+P$ is

(A) –1 (B) 2 (C) 4 (D) 5

2. If $f(x)=\begin{vmatrix}(1+x)^a & (1+2x)^b & 1\\ 1 & (1+x)^a & (1+2x)^b\\ (1+2x)^b & 1 & (1+x)^a\end{vmatrix}$; a,b being positive integers, then

(A) constant term in $f(x)$ is 4 (B) coefficient of x in $f(x)$ is 0

(C) constant term in $f(x)$ is $(a-b)$ (D) constant term in $f(x)$ is $(a+b)$

3. A man has 3 pairs of black socks and 2 pairs of brown socks kept together in a box. If he dressed hurriedly in the dark, the probability that after he has put on a black sock, he will then put on another black sock is

(A) $\frac{1}{3}$ (B) $\frac{2}{3}$ (C) $\frac{3}{5}$ (D) $\frac{2}{15}$

4. Let the cosine of angle between the vectors $\vec{p}$ and $\vec{q}$ be λ such that $2\vec{p}+\vec{q}=\hat{i}+\hat{j}$ and $p+2q=\hat{i}-\hat{j}$, then λ is equal to

(A) $\frac{5}{9}$ (B) $-\frac{4}{5}$ (C) $\frac{3}{9}$ (D) $\frac{7}{9}$

(One or More Than One Options Correct Type)

This section contains **3 multiple choice questions.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONE** or **MORE THAN ONE is correct.**

5. Consider the equation of line AB is $\frac{x}{2}=\frac{y}{-3}=\frac{z}{6}$. Through a point P (1, 2, 5) line PN is drawn perpendicular to AB and line PQ is drawn parallel to the plane $3x+4y+5z=0$ to meet AB is Q. Then,

(A) coordinates of N are $\left(\frac{52}{49},-\frac{78}{49}.\frac{156}{49}\right)$

(B) the coordinates of Q are $\left(3,-\frac{9}{2},9\right)$

(C) the equation of PN is $\frac{x-1}{3}=\frac{y-2}{-176}=\frac{Z-5}{-89}$

(D) coordinates of N are $\left(\frac{156}{49},\frac{52}{49}-\frac{78}{49}\right)$

Space For Rough Work

6. A curve $y=f(x)$ passes through (1, 1) and tangent at P (x, y) cuts the x – axis and y – axis at A and B respectively such that $BP:AP=3:1$, then

(A) equation of curve is $xy'-3y=0$ (B) normal at (1, 1) is $x+3y=4$

(C) curve passes through $\left(2,\frac{1}{8}\right)$ (D) equation of curve is $xy'+3y=0$

7. Let A and B are two square idempotent matrices such that $AB\pm BA$ is a null matrix, the value of $\det(A-B)$ can be equal to

(A) –1 (B) 0

(C) 1 (D) 2

(Matching List Sets)

This section contains **Three (03)** Matching List Sets. Each set has **ONE** Multiple Choice Question. Each set has **TWO** lists: **List-I** and **List-II**. **List-I** has **Four** entries (P), (Q), (R) and (S) and **List-II** has **Five** entries (1), (2), (3), (4) and (5). **FOUR** options are given in each Multiple Choice Question based on **List-I** and **List-II** and **ONLY ONE** of these four options satisfies the condition asked in the Multiple Choice Question.

8. Match the following Lists:

	List – I		List – II
(P)	Coefficient of x in $f(x)=\begin{vmatrix} x & (1+\sin x)^3 & \cos x \\ 1 & \log(1+x) & 2 \\ x^2 & 1+x^2 & 0 \end{vmatrix}$, when each of $\sin x, \cos x$ and $\log(1+x)$ is expanded in powers of x, is	(1)	10
(Q)	Value of $\begin{vmatrix} 1 & 3\cos\theta & 1 \\ \sin\theta & 1 & 3\cos\theta \\ 1 & \sin\theta & 1 \end{vmatrix}$ is	(2)	0
(R)	If a, b, c are in A.P. and $f(x)=\begin{vmatrix} x+a & x^2+1 & 1 \\ x+b & 2x^2-1 & 1 \\ x+c & 3x^2-2 & 1 \end{vmatrix}$, then $f'(0)$ is	(3)	–12
(S)	If $\begin{vmatrix} x & 2 & x \\ 1 & x & 6 \\ x & x & x+1 \end{vmatrix}=a_4x^4+a_3x^3+a_2x^2+a_1x+a_0$, then a_0 is	(4)	–2
		(5)	1

(A) P → 4, Q →1, R →2, S →4 (B) P →5, Q →4, R →1, S →2

(C) P → 3, Q →4, R →5, S →2 (D) P →1, Q →4, R →4, S →2

Space For Rough Work

9. Match the entries between following two columns.

	List – I		List – II
(P)	If the line $\frac{x-1}{1}=\frac{y+1}{-2}=\frac{z+1}{\lambda}$ lies in the plane $3x-2y+5z=0$, then λ is equal to	(1)	$\sin^{-1}\sqrt{\frac{6}{25}}$
(Q)	If $(3,\lambda,\mu)$ is a point on the line $2x+y+z-3=0=x-2y+z-1$, then $\lambda+\mu$ is equal to	(2)	$-\frac{7}{5}$
(R)	The angle between the line $x=y=z$ and the plane $4x-3y+5z=2$ is	(3)	–3
(S)	The angle between the planes $x+y+z=0$ and $3x-4y+5z=0$ is	(4)	$\cos^{-1}\sqrt{\frac{8}{75}}$
		(5)	–5

(A) P → 2, Q →3, R →1, S →4 (B) P →5, Q →1, R →2, S →3
(C) P → 1, Q →4, R →2, S →5 (D) P →4, Q →1, R →2, S →3

10. Match the following:

	List – I		List – II
(P)	The differential equation of the family of curves $y=e^x(A\cos x+B\sin x)$, where A, B are arbitrary constants, has the degree n and order m. Then, the values of n and m are, respectively	(1)	2, 1
(Q)	The degree and order of the differential equation of the family of all parabolas whose axis is the x – axis, are respectively	(2)	1, 1
(R)	The order and degree of the differential equation of the family of circles touching the x – axis at the origin, are respectively	(3)	2, 2
(S)	The degree and order of the differential equation of the family of ellipse having the same foci, are respectively.	(4)	1, 2
		(5)	2, 3

The correct option is
(A) P→(1) Q → (1) R→(5) S→(2) (B) P→(5) Q → (5) R→(1) S→(2)
(C) P→(4) Q → (4) R→(2) S→(1) (D) P→(4) Q → (1) R→(4) S→(2)

Space For Rough Work

(PART – B)

This section contains **SIX (06)** numerical based questions. The answer to each question is a NUMERICAL VALUE. If the numerical value has more than two decimal places, truncate/round-off the value to TWO decimal places.

1 Let A and B be two non – singular matrices such that $A \neq I, B^3 = I$ and $AB = BA^2$, where I is the identity matrix, the least value of k such that $A^k = I$ is

2. If the line $\frac{x-4}{1} = \frac{y-2}{1} = \frac{z-k}{2}$ lies exactly on the plane $2x - 4y + z = 7$, the value of k is

3. If $\Delta_r = \begin{vmatrix} r & 612 & 915 \\ 101r^2 & 2r & 3r \\ r & \frac{1}{r} & \frac{1}{r^2} \end{vmatrix}$, then the value of $\lim_{n\to\infty} \frac{1}{n^3} \sum_{r=1}^{n} \Delta_r$ is _____.

4. The minimum number of times a fair coin needs to be tossed, so that the probability of getting at least two heads is at least 0.96, is _____.

5. Given that $\vec{u} = \hat{i} - 2\hat{j} + 3\hat{k}$; $\vec{v} = 2\hat{i} + \hat{j} + 4\hat{k}$; $\vec{w} = \hat{i} + 3\hat{j} + 3k$ and $(\vec{u}.\vec{R} - 15)\hat{i} + (\vec{v}.\vec{R} - 30)\hat{j} + (\vec{w}.\vec{R} - 20)\hat{k} = 0$. Then, the greatest integer less than or equal to $|R|$ is

6. Find the constant of integration by the general solution of the differential equation $(2x^2y - 2y^4)dx + (2x^3 + 3xy^3)dy = 0$ if curve passes through (1, 1).

Space For Rough Work

FIITJEE INTERNAL TEST

BATCHES – PANINI426-G1 & PANINI426XII-1

Phase Test – 7 (Paper-1)

Code: 101114

JEE ADVANCED

ANSWER KEY

ANSWER KEYS

Physics

PART – A

1.	D	2.	A	3.	A	4.	D
5.	BCD	6.	ABD	7.	BD	8.	C
9.	A	10.	B				

PART – B

1.	6	2.	2	3.	2	4.	6
5.	0.02	6.	63				

Chemistry

PART – A

1.	C	2.	B	3.	C	4.	C
5.	ABC	6.	AB	7.	AB	8.	A
9.	B	10.	A				

PART – B

1.	7	2.	2	3.	3	4.	3
5.	6	6.	13				

Mathematics

PART – A

1.	D	2.	B	3.	A	4.	B
5.	ABC	6.	CD	7.	ABC	8.	D
9.	A	10.	C				

PART – B

1.	7	2.	7	3.	2	4.	8
5.	6	6.	1				