FIITJEE INTERNAL Phase Test

BATCHES – NWCM426B1R & B1W – PT – 1

PHYSICS, CHEMISTRY & MATHEMATICS

QP CODE: 100766 | **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.

Forthcoming Exam – FTRE on 15th Sept. 2024.

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.

* **In multiple choice questions the options are given as F,T,R & E which correspond to the options A,B,C & D respectively in the 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 (08-11) –** This section contains Four (04) 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 **+3 Marks** for correct answer and **-1 marks** for wrong answer.

(iii) **Part-B (01-06)** This section contains **SIX (06)** questions. The answer to each question is a **NON-NEGATIVE INTEGER**. For each question, enter the correct integer corresponding to the answer. Each question carries **+4 marks** for correct answer. **There is no negative marking.**

Name of the Candidate: _____

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

Enrolment Number: _____

*** In multiple choice questions the options are given as F,T,R & E which correspond to the options A,B,C & D respectively in the OMR sheet.**

SECTION – I: PHYSICS

(PART – A)

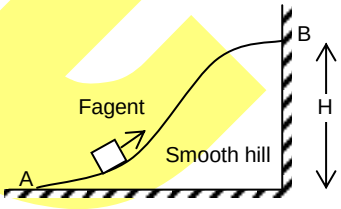
(Single Correct Answer Type)

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 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

(F) $\frac{v_0}{g\cos\theta}$ (T) $\frac{v_0}{g\sin\theta}$ (R) $\frac{v_0}{g}\tan\theta$ (E) $\frac{v_0}{g}\cot\theta$

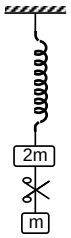
2. A external agent moves the block m slowly from A to B, along a smooth hill such that every time he applies the force tangentially. Find the work done by agent in this interval.



(F) $\frac{m^2g^2H^2}{L}$ (T) $\frac{mgH^2}{L}$

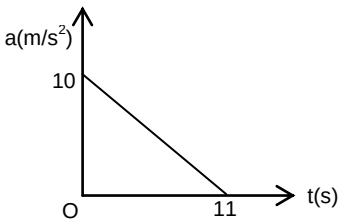
(R) mg(H+L) (E) mgH

3. System shown in figure is in equilibrium and at rest. The spring and string are massless, now the string is cut. The acceleration of mass 2 m and m just after the string is cut will be



(F) g/2 upwards, g downwards
(T) g upwards, g/2 downwards
(R) g upwards, 2g downwards
(E) 2 g upwards, g downwards

4. A particle starts from rest. Its a-t graph is as shown in the figure. The maximum speed of the particle will be



(F) 110 m/s (T) 55 m/s

(R) 550 m/s (E) 660 m/s

Space For Rough Work

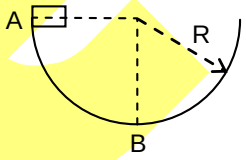
(One or More Than One Options Correct Type)

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. 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
(F) going up and slowing down (T) going up and speeding up
(R) going down and slowing down (E) going down and speeding up.

6. 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.
(F) The minimum time in which he can cross the river is $\frac{d}{v}$.
(T) He can reach the point P in time $\frac{d}{v}$.
(R) He can reach the point P in time $\frac{d}{\sqrt{v^2-u^2}}$
(E) He cannot reach P if u > v.

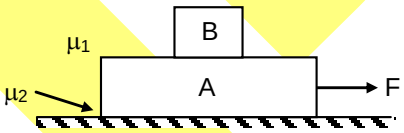
7. A small block of mass m is released from rest from position A inside a smooth hemispherical bowl of radius R as shown in figure. Choose the wrong option.
(F) Acceleration of block is constant throughout
(T) Acceleration of block is g at A
(R) Acceleration of block is 3g at B
(E) Acceleration of block is 2g at B



Matching List Sets)

This section contains **FOUR (04)** 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.



List-I		List-II	
(P)	Acceleration of A or B	(1)	$\frac{4}{3}$
(Q)	Normal reaction between blocks	(2)	$\frac{2}{3}$
(R)	Frictional force between blocks f_1	(3)	20
(S)	Frictional force on surface f_2	(4)	0
		(5)	1

F = 4 Newton, m_A = 4, m_B = 2, μ_1 = 0.1 and μ_2 = 0, frictional force between blocks is f_1 and between surface and block A is f_2 (g = 10 m/sec^2)
(F) P → 2 ; Q → 1 ; R → 3 ; S → 4 (T) P → 2 ; Q → 4 ; R → 1 ; S → 3
(R) P → 4 ; Q → 3 ; R → 2 ; S → 1 (E) P → 2 ; Q → 3 ; R → 1 ; S → 4

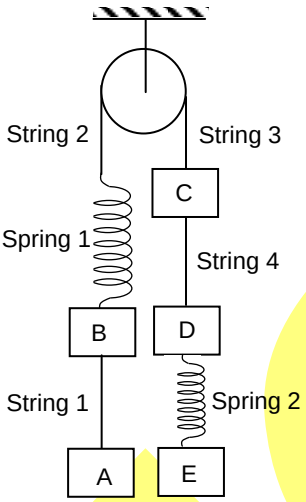
Space For Rough Work

9. The system shown below is initially in equilibrium

$m_A = m_B = 3kg$

$m_C = m_D = m_E = 2kg$

Take g = 10 m/s^2



List–I gives the four strings while List–II the value of the tension in the strings.

List – I		List – II	
(P)	String 1	(1)	10 N
(Q)	String 2	(2)	20 N
(R)	String 3	(3)	30 N
(S)	String 4	(4)	40 N
		(5)	60 N
		(6)	0 N

If the spring 2 is cut, match the correct for the tension in the strings just after the cutting.

(F) P $\rightarrow$ 3, Q $\rightarrow$ 5, R $\rightarrow$ 5, S $\rightarrow$ 3 (T) P $\rightarrow$ 3, Q $\rightarrow$ 6, R $\rightarrow$ 6, S $\rightarrow$ 3

(R) P $\rightarrow$ 6, Q $\rightarrow$ 3, R $\rightarrow$ 3, S $\rightarrow$ 1 (E) P $\rightarrow$ 1, Q $\rightarrow$ 2, R $\rightarrow$ 2, S $\rightarrow$ 3

10. Four particles 1, 2, 3, 4 are launched as projectiles having an initial speed u and angle of projection θ. It is found that particle 1 with initial speed u_0 and initial angle of projection $\theta_0 = 23°$ has time of flight T_0 and horizontal range R_0. (Take sin 23° = 5/13)

List-I gives the above four particles with their projection angels, while List-II gives magnitudes of some quantity.

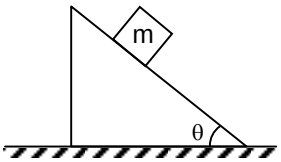
List-I		List-II	
(P)	$\theta_1 = 23°$	(1)	$\frac{13}{10}$
(Q)	$\theta_2 = 30°$	(2)	$\frac{39}{25}$
(R)	$\theta_3 = 37°$	(3)	1
(S)	$\theta_4 = 45°$	(4)	$\frac{13}{5\sqrt{2}}$
		(5)	$\frac{\sqrt{3}}{15}$
		(6)	$\frac{35}{25}$

If the four particles are launched with the initial speeds, u_0 ; $\frac{4}{13}u_0$; $u_0\sqrt{\frac{15}{13}}$; $u_0\sqrt{\frac{12}{13}}$ then the correct match for their respective ranges in the units of R_0 is

(F) P $\rightarrow$ 1 ; Q $\rightarrow$ 2 ; R $\rightarrow$ 2 ; S $\rightarrow$ 3 (T) P $\rightarrow$ 3 ; Q $\rightarrow$ 5 ; R $\rightarrow$ 2 ; S $\rightarrow$ 6

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

11. A block of mass m is placed on a fixed incline of inclination θ and the coefficient of friciton between the block and the incline is μ.



List-I		List-II	
(P)	30°	(1)	$\frac{1}{2}$
(Q)	37°	(2)	$\frac{3}{5}$
(R)	45°	(3)	$\frac{1}{\sqrt{2}}$
(S)	60°	(4)	$\frac{4}{5}$
		(5)	$\frac{\sqrt{3}}{2}$
		(6)	1

If $\mu = 1$, then the force of friction acting on the block (in units of mg) will be given by:

(F) P $\rightarrow$ 5 ; Q $\rightarrow$ 4 ; R $\rightarrow$ 3 ; S $\rightarrow$ 1 (T) P $\rightarrow$ 5 ; Q $\rightarrow$ 4 ; R $\rightarrow$ 6 ; S $\rightarrow$ 1

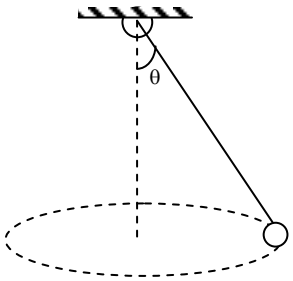
(R) P $\rightarrow$ 1 ; Q $\rightarrow$ 2 ; R $\rightarrow$ 3 ; S $\rightarrow$ 5 (E) P $\rightarrow$ 1 ; Q $\rightarrow$ 2 ; R $\rightarrow$ 3 ; S $\rightarrow$ 1

(PART – B)

(Non – Negative Integer)

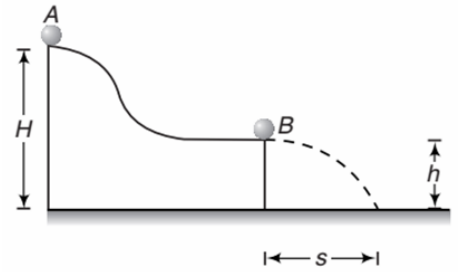
1. A car driver applies the brakes which retards the car at a rate of 8 m/s^2. If the initial velocity of the car is 10 m/s, the speed of the car after 5 s will be

2. In the conical pendulum, the centripetal force will be ($\theta = 45^0$, m = 0.1 kg, g = 10 m/s^2)

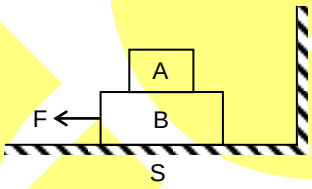


Space For Rough Work

3. A small disc A slides down with initial velocity equal to zero from the top of a smooth hill of height H = 4 meter having a horizontal portion. What must be height of the horizontal portion h to ensure the maximum distance s covered by the disc?

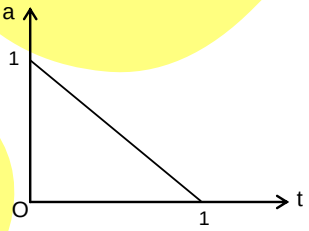


4. Block A weighs 4 N and block B weights 8 N. The coefficient of kinetic friction is 0.25 for all surfaces. Find the force F to slide B at a constant speed when A rests on B and moves with it.



5. A body constrained to move in *y*-direction is subjected to a force given by $\vec{F}=(-2\vec{i}+15\vec{j}+6\vec{k})N$. The work done by this force in moving the body a distance of 10m along the *y*-axis (in Joule) is _____.

6. A particle starting from rest moves in a straight line with acceleration as shown in the a–t graph. Find the distance travelled by the particle in the first four seconds from start of its motion.



Space For Rough Work

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SECTION – II: CHEMISTRY

(PART – A)

(Single Correct Answer Type)

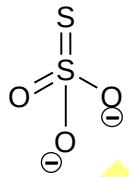
This section contains **4 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct.**

1. Equal mass of which of the following gas will develop the highest pressure if they are enclosed in containers of equal volume at constant temperature?
   (F) CO_2 (T) SO_2
   (R) CH_4 (E) C_2H_4

2. Which of the following sub-shell contains maximum number of atomic orbitals?
   (F) 4s (T) 4p
   (R) 4d (E) 4f

3. If the average kinetic energy of $N_2(g)$ at 400 K is 600 R, then what will be the average kinetic energy of N(g) at the same temperature?
   (F) 600 R (T) 300 R
   (R) 1200 R (E) 150 R

4. What is the oxidation number of the sulphur atoms in the following structure?



   (F) +4 and zero (T) +4 and -2
   (R) +2 and +1 (E) +2 and zero

(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. The particles of which radiation(s) has/have constant charge to mass ratio irrespective of their source of formation?
   (F) Cathode ray (T) Anode ray
   (R) Alpha ray (E) X-ray

Space For Rough Work

6. Which of the following element(s) has/have higher I.E_1 than sodium?
(F) Li (T) Mg
(R) K (E) Al

7. Which of the following contains nitrogen atom(s) in positive oxidation state(s)?
(F) NH_4Cl (T) HNO_3
(R) N_2O_3 (E) NO_2BF_4

Matching List Sets)

This section contains **FOUR (04)** 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 Lists.

List – I (Quantum numbers)		**List – II (Characteristics)**	
(P)	Principal quantum numbers	(1)	Orientations of atomic orbitals are decided by this quantum number
(Q)	Azimuthal quantum numbers	(2)	Represent energy of electrons
(R)	Magnetic quantum numbers	(3)	Represents sub-shell or sub-orbit which are associated with energy shell or orbits
(S)	Spin quantum numbers	(4)	Represent the spin motion of electrons
		(5)	Number of orbitals associated with the orbits

(F) P $\rightarrow$ 5; Q $\rightarrow$ 1; R $\rightarrow$ 3; S $\rightarrow$ 4 (T) P $\rightarrow$ 5; Q $\rightarrow$ 2; R $\rightarrow$ 3; S $\rightarrow$ 4
(R) P $\rightarrow$ 2; Q $\rightarrow$ 3; R $\rightarrow$ 1; S $\rightarrow$ 4 (E) P $\rightarrow$ 2; Q $\rightarrow$ 1; R $\rightarrow$ 3; S $\rightarrow$ 4

9. Match the Lists.

List – I (Reactions)		**List – II (Equivalent mass of the underlined compounds)**	
(P)	$C + \underline{O_2} \longrightarrow \underline{CO_2}$	(1)	31
(Q)	$MgO + 2HCl \longrightarrow \underline{MgCl_2} + H_2O$	(2)	98
(R)	$\underline{H_3PO_4} + NaOH \longrightarrow NaH_2PO_4 + H_2O$	(3)	47.5
(S)	$\underline{2NO_3^-} \longrightarrow 2NO_2^- + O_2$	(4)	11
		(5)	49

(F) P $\rightarrow$ 3; Q $\rightarrow$ 5; R $\rightarrow$ 2; S $\rightarrow$ 1 (T) P $\rightarrow$ 4; Q $\rightarrow$ 3; R $\rightarrow$ 2; S $\rightarrow$ 1
(R) P $\rightarrow$ 4; Q $\rightarrow$ 3; R $\rightarrow$ 5; S $\rightarrow$ 1 (E) P $\rightarrow$ 3; Q $\rightarrow$ 4; R $\rightarrow$ 1; S $\rightarrow$ 2

Space For Rough Work

10. Match the Lists.

List – I (Compounds)		List – II (Properties)	
(P)	CO_2	(1)	Forms hydrogen bonding between it's own molecules and with other suitable molecules
(Q)	SO_2	(2)	Dipole moment is zero
(R)	H_2O	(3)	Has tetrahedral shape
(S)	CH_4	(4)	Has angular shape
		(5)	Central atom contains two lone pairs

(F) P → 2; Q → 5; R → 4; S → 1 (T) P → 4; Q → 2; R → 5; S → 1
(R) P → 2; Q → 4; R → 1; S → 3 (E) P → 4; Q → 2; R → 1; S → 3

11. Match the Lists.

List – I (Elements)		List – II (Characteristics)	
(P)	Li and Mg	(1)	Forms electron deficient covalent compounds
(Q)	Na and K	(2)	Forms compounds with same oxidation states
(R)	F and Cl	(3)	Known as halogens
(S)	B and Al	(4)	Diagonal relationship
		(5)	Have identical polarizing power

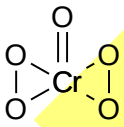
(F) P → 2; Q → 3; R → 1; S → 2 (T) P → 4; Q → 1; R → 2; S → 5
(R) P → 3; Q → 2; R → 1; S → 4 (E) P → 4; Q → 2; R → 3; S → 1

(PART – B)

(Non – Negative Integer)

1. What is the sum of the number of lone-pair(s) and bond-pairs of electrons present in NH_3?

2. If the oxidation number of chromium in the given molecule is +x, then x is :



3. $Cr_2O_7^{2-} + Fe^{2+} + H^+ \longrightarrow Cr^{3+} + Fe^{3+} + H_2O$

400 mL of 0.5 N $Cr_2O_7^{2-}$ solution oxidizes 50 mL solution containing Fe^{2+} ions. What is the normality of the Fe^{2+} solution?

4. What is the mass percentage of oxygen in magnesium oxide?

5. One litre aqueous solution containing 0.4 moles of NaOH and 1.6 moles of Na_2CO_3 required 400 mL of HCl solution for the neutralization in the presence of phenolphthalein indicator. What is the molarity of the HCl solution?

6. The root mean square velocity of an ideal gas at 600 K is 80 ms^{-1}. What will be the rms speed is the temperature is increase to 2400 K?

Space For Rough Work

*** In multiple choice questions the options are given as F,T,R & E which correspond to the options A,B,C & D respectively in the OMR sheet.**

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. $\lim\limits_{x\to 2}\dfrac{\sqrt{x-2}+\sqrt{x}-\sqrt{2}}{\sqrt{x^2-4}}$ is equal to

   (F) $\dfrac{1}{2}$ (T) 1

   (R) 2 (E) None of these

2. The range of $f(x)=\dfrac{1}{3\sin x+4\cos x}$ is equal to

   (F) $[-5,5]$ (T) $\left[-\dfrac{1}{5},\dfrac{1}{5}\right]$

   (R) $\left(-\infty,-\dfrac{1}{5}\right]\cup\left[\dfrac{1}{5},\infty\right)$ (E) None of these

3. Through a point A on the x – axis a straight line is drawn parallel to y – axis so as to meet the pair of straight lines $ax^2+2hxy+by^2=0$ in B and C. If AB = BC then

   (F) $h^2=4ab$ (T) $8h^2=9ab$

   (R) $9h^2=8ab$ (E) $4h^2=ab$

4. If $y=\log_e\left(\sqrt{e}.\sin x\right)$; then $\dfrac{dy}{dx}=?$

   (F) $\cot x$ (T) $\left(\dfrac{1}{\sqrt{e}}\right).\cot x$

   (R) $\dfrac{1}{2}\cot x$ (E) $\left(\sqrt{e}\right).(\cot x)$

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. From a point 'A' on x – axis, two tangents are drawn to the circle $x^2+y^2=16$ meeting y – axis at 'P' and 'Q' then:

(F) $\min.\left(AP^2+AQ^2\right)=128$

(T) $\min.\text{area}\ \Delta APQ=32$

(R) $\min.\left(OA^2+OP^2\right)=64$

(E) For min. area of ΔAPQ, A is $\left(4\sqrt{2},0\right)$ or $\left(-4\sqrt{2},0\right)$

6. If $\log_3\left(\log_2 x\right)+\log_{\frac{1}{3}}\left(\log_{\frac{1}{2}} y\right)=1$ and $xy^2=9$, then:

(F) $xy=81$

(T) $xy=9$

(R) number of possible ordered pairs (x, y) is 2

(E) number of possible ordered pairs (x, y) is 1

7. A line 'L' passing through the point (2, 1) intersects the curve $4x^2+y^2-x+4y-2=0$ at the points 'A' and 'B'. If the lines 'OA' and 'OB' are such that the co – ordinate axes are the angle bisectors between them, then possible equations of line 'L' are:-

(F) $4y=x+2$ (T) $y=x-1$

(R) $4y-3x+2=0$ (E) $x+2y=4$

Matching List Sets)

This section contains **FOUR (04)** 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 List

	List – I		List – II
(P)	$\int_0^{\pi/2}\frac{\cos x}{\sqrt{1+\sin x}}dx=$	(1)	4
(Q)	$\int_0^{\pi/2}\cos^3 x\,dx=$	(2)	$2\left(\sqrt{2}-1\right)$
(R)	$\frac{\log_{10}\left(x-3\right)}{\log_{10}\left(x^2-21\right)}=\frac{1}{2}$; then $x=$	(3)	$\frac{2}{3}$
(S)	$\lim_{x\to 1}\frac{x-1}{x^{1/4}-1}=$	(4)	5
		(5)	2

(F) P→ (3); Q → (2) ; R→(1); S→(4) (T) P→ (3); Q → (2) ; R→(5); S→(4)

(R) P→ (2); Q → (1) ; R→(4); S→(5) (E) P→ (2); Q → (3) ; R→(4); S→(1)

Space For Rough Work

9. Match the following List

List – I		List - II	
(P)	If $A=\sin\frac{2\pi}{7}+\sin\frac{4\pi}{7}+\sin\frac{8\pi}{7}$ and $B=\cos\frac{2\pi}{7}+\cos\frac{4\pi}{7}+\cos\frac{8\pi}{7}$, then $\sqrt{A^2+B^2}$ is equal to	(1)	1
(Q)	$\frac{\cos 20^\circ+8\sin 70^\circ\sin 50^\circ\sin 10^\circ}{\sin^2 80^\circ}$ is equal to	(2)	$\sqrt{2}$
(R)	If $\cos\alpha=\frac{2\cos\beta-1}{2-\cos\beta}$, then $\tan^2\frac{\alpha}{2}.\cot^2\frac{\beta}{2}$ has the value equal to {where $\alpha,\beta\in(0,\pi)$}	(3)	2
(S)	Exact value of $\cos 20^\circ+2\sin^2 55^\circ-\sqrt{2}\sin 65^\circ$	(4)	3
		(5)	0

(F) P→ (3); Q → (2) ; R→(1); S→(4) (T) P→ (3); Q → (2) ; R→(5); S→(4)
(R) P→ (2); Q → (3) ; R→(4); S→(1) (E) P→ (2); Q → (1) ; R→(5); S→(3)

10. Match the List:

	List – I		List – II
(P)	If $ax+by-5=0$ is the equation of the chord of the circle $(x-3)^2+(y-4)^2=4$, which passes through (2, 3) and at the greatest distance from the centre of the circle, then $\lvert a+b\rvert$ is equal to	(1)	6
(Q)	Let 'O' be the origin and 'P' be a variable point on the circle $x^2+y^2+2x+2y=0$. If the locus of mid – point of OP is $x^2+y^2+2gx+2fy+c=0$, then $(g+f)$ is equal to	(2)	3
(R)	The 'x' co – ordinate of the centre of the smallest circle which cuts the circles $x^2+y^2+2x-4y+4=0$ and $x^2+y^2-10x+12y+52=0$ orthogonally is	(3)	2
(S)	If 'θ' be the angle between two tangents which are drawn to the circle $x^2+y^2-6\sqrt{3}x-6y+27=0$ from the origin, then $2\sqrt{3}\tan\theta$ equals to	(4)	1
		(5)	4

(F) P→4; Q → 3; R→1; S→2 (T) P →3; Q→4; R→2; S→1
(R) P→3; Q → 1; R→4; S→ 5 (E) P→3; Q → 4; R→1; S→2

Space For Rough Work

11. If $\cos\alpha+\cos\beta=\frac{1}{2}$ and $\sin\alpha+\sin\beta=\frac{1}{3}$, then match the List:

	List – I		List – II
(P)	$\cos\left(\frac{\alpha+\beta}{2}\right)$	(1)	$\pm\sqrt{\frac{13}{12}}$
(Q)	$\cos\left(\frac{\alpha-\beta}{2}\right)$	(2)	$\frac{3}{2}$
(R)	$\tan\left(\frac{\alpha+\beta}{2}\right)$	(3)	$\pm\frac{3}{\sqrt{13}}$
(S)	$\tan\left(\frac{\alpha-\beta}{2}\right)$	(4)	$\pm\sqrt{\frac{131}{13}}$
		(5)	$\frac{2}{3}$

(F) P→ (3); Q → (1) ; R→(5); S→(4) (T) P→ (3); Q → (2) ; R→(5); S→(4)
(R) P→ (2); Q → (1) ; R→(4); S→(5) (E) P→ (2); Q → (1) ; R→(4); S→(3)

(PART – B)

(Non – Negative Integer)

1. If $\sec A\tan B+\tan A\sec B=91$, then the value of $(\sec A\sec B+\tan A\tan B)^2$ is equal to

2. If $\log_x y+\log_y x^2=3$, then find the sum of all possible values of $\log_x y^3$.

3. The vertex of a right angled triangle lies on the straight line $2x+y-10=0$ and the two other vertices, at points (2, –3) and (4, 1) then the area of triangle in sq. units is

4. If the values of 'x' satisfying the equation $|2x+3|-|x-1|=6$ are α,β then $|\alpha\beta|$ is

5. Number of integral solutions of the inequality $\frac{(x+1)^2(2x-3)}{(x+7)^3}\le 0$

6. Let 'A' be the centre of the circle $x^2+y^2-2x-4y-20=0$. Suppose that the tangents at the points B (1, 7) and D (4, –2) on the circle meet at the point 'C'. Then the area of quadrilateral ABCD is

Space For Rough Work

FIITJEE INTERNAL TEST

BATCHES – NWCM426B1R & B1W

Phase Test – 1

Paper – 1

Code: 100766

JEE ADVANCED LEVEL

ANSWER KEY

ANSWER KEYS

Physics

PART – A

1.	T	2.	E	3.	F	4.	T
5.	TR	6.	FRE	7.	FR	8.	E
9.	F	10.	R	11.	E		

PART – B

1.	0	2.	1	3.	2	4.	3
5.	150	6.	4				

Chemistry

PART – A

1.	R	2.	E	3.	F	4.	F
5.	FRE	6.	FTE	7.	TRE	8.	R
9.	T	10.	R	11.	E		

PART – B

1.	4	2.	6	3.	4	4.	40
5.	5	6.	160				

Mathematics

PART – A

1.	F	2.	R	3.	T	4.	F
5.	FTRE	6.	FE	7.	FE	8.	E
9.	R	10.	T	11.	F		

PART – B

1.	8282	2.	9	3.	3	4.	20
5.	8	6.	75				