FIITJEE INTERNAL TEST (PHASE-1) CLASS-XI

BATCHES- Two Year CRP (2018-20)

PHYSICS, CHEMISTRY & MATHEMATICS

CPT1	PHASE-1	CODE :	PAPER - 2

Time Allotted: 3 Hours **Maximum Marks: 201**

- 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 Parts.
3. **Part-I** is Physics, **Part-II** is Chemistry and **Part-III** is Mathematics.
4. Each part is further divided into two sections: **Section A & B.**
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 Three Parts.

(i) **Section-A (01 – 06)** contains 6 multiple choice questions which have only one correct answer. Each question carries **+3 marks** for correct answer and **– 1 mark** for wrong answer.

Section-A (07 – 09) contains 3 Assertion-Reasoning multiple choice questions which have only one correct answer. Each question carries **+3 marks** for correct answer and **– 1 mark** for wrong answer.

Section-A (10 – 15) contains 2 paragraphs. Based upon each paragraph, 3 multiple choice questions have to be answered. Each question has only one correct answer and carries **+4 marks** for the correct answer and **– 1 mark** for wrong answer.

(ii) **Section-B (01 – 02)** contains 2 Matrix Match Type Questions which have statements given in 2 columns. Statements in the first column have to be matched with statements in the second column. There may be One or More Than One Correct choices. Each question carries **+8 marks** for all correct answer however for each correct row **+2 marks** will be awarded and **–1 mark** for each row matched incorrectly.

Name of the Candidate :_____

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

Enrolment Number :_____

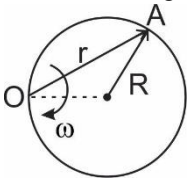
PART – I : PHYSICS

SECTION – A : (Single Correct Answer Type)

This section contains **6 multiple choice** questions. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

1. From an elevated point A, a stone is projected vertically upward. When the stone reaches a distance h below A, its velocity is double of what it was at a height h above A. Then the greatest height obtained by the stone above A is
(A) 5h/3 (B) h (C) 10h/3 (D) 3h/2

2. A particle A moves along a circle of radius R so that its position vector r relative to point O rotates with a constant angular velocity ω. Then the modulus of the net acceleration of the particle is

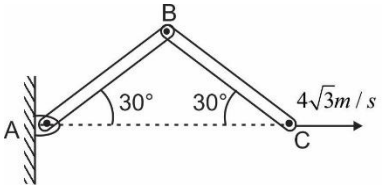


(A) $4\omega^2 R$ (B) $\omega^2 R$ (C) $2\omega^2 R$ (D) $3\omega^2 R$

3. Given $\vec{F} = (xy^2)\hat{i} + (x^2y)\hat{j}$ Newton. Find the work done by $\vec{F}$when a particle is taken along the semicircular path OAB where the co – ordinates of B are (4,0) and O is the origin.
(A) 65/3 J (B) 75/2 J (C) 73/4 J (D) 0 J

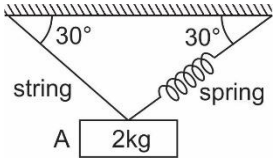
4. A man travelling west at 4 km/h, finds that the wind appears to blow from the south. On doubling his speed he finds that the wind appears to blow from the southwest. Then the magnitude of the wind's velocity is
(A) 4 km/h (B) $4\sqrt{2}$km/h (C) $8\sqrt{2}$km/h (D) 8 km/h

5. Two rods AB and BC are hinged at the end B. End A is hinged to a vertical wall as shown in the figure. The end C pulled towards right with a constant speed of $4\sqrt{3}$ m/s. Then the speed of the hinged point B at the instant shown is



(A) 18 m/s (B) $3\sqrt{3}$ m/s (C) $4\sqrt{3}$ m/s (D) 15 m/s

6. A block A of mass m = 2 kg is held in equilibrium by the help of a string and a spring. Then the magnitude of acceleration of the block A, immediately after the string is cut is



(A) $\sqrt{3}$g (B) g (C) 2g (D) g/2

Reasoning Type

This section contains **3 reasoning** type questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

(A) Statement – 1 is true Statement – 2 is true ; statement-2 is a correct explanation for statement -1
(B) Statement – 1 is true Statement – 2 is true ; statement-2 is a NOT correct explanation for statement -1
(C)Statement – 1 is true, statement – 2 is false
(D) Statement – 1 is false, statement 2 is true

7. **Statement – 1 :** An object can possess acceleration even at a time when it has uniform speed
Statement – 2 : It is possible when the direction of motion keeps changing

8. **Statement – 1 :** For an observer looking out through the window of a fast moving train, the nearby objects appear to move in the opposite direction to the train, while the distant objects appear to be stationary.
Statement – 2 : If the observer and the object are moving with velocities $\vec{v}_1$ and $\vec{v}_2$ respectively with reference to a laboratory frame, the velocity of the object with respect to the observer is $\vec{v}_2 - \vec{v}_1$.

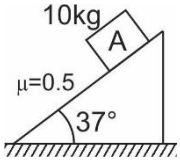
9. **Statement – 1:** If two vectors $\vec{A}$ and $\vec{B}$ are related as: $|\vec{A} + \vec{B}| = |\vec{A} - \vec{B}|$, then the vectors $\vec{A}$ and $\vec{B}$ must be perpendicular to each other.
Statement – 2 : $(\vec{A} + \vec{B})$ and $(\vec{A} - \vec{B})$ represent the diagonals of a parallelogram of which $\vec{A}$ and $\vec{B}$ are the adjacent sides.

Paragraph type (One Option Correct)

This section contains **TWO** paragraphs. Based on each paragraph, there will be **THREE** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONE of these four option(s) is correct**.

Paragraph for question Nos. 10 to 12

A block 'A' of mass 10 kg is held on a fixed inclined plane having an inclination of 37^0. Coefficient of friction between the block and the inclined surface is 0.5.(take g= 10 m/s^2)

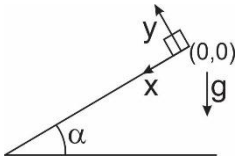


Answer the following questions based on the above given information.

10. What will be the acceleration of the block just after it is released
(A) 2 m/s^2 (B) zero (C) 6 m/s^2 (D) 10 m/s^2

11. If a variable force F is applied on the block directed up along the plane, then the range of magnitude of the force (F) for which the block remains at rest will be
(A) $0\ \text{N} \le \text{F} \le 100\ \text{N}$ (B) $20\ \text{N} \le \text{F} \le 75\ \text{N}$
(C) $20\ \text{N} \le \text{F} \le 100\ \text{N}$ (D) $30\ \text{N} \le \text{F} \le 100\ \text{N}$

12. Consider that the variable force is not present. The block is released from a position on the inclined plane marked as origin (0, 0). The coefficient of friction varies with the distance x along the x – axis (refer figure) as $\mu = 2x$. The distance travelled by the block along the inclined plane before the block comes to rest is? [$\alpha = 37°$]



(A) 3/4 m (B) 1m (C) 2m (D) 5/4 m

Paragraph for question Nos. 13 to 15

Bungee jumping is a sport in which a person jumps from a bridge using strong elastic rubber band which has one end tied to a person's leg and the other end to the bridge, such that the band (eventually) stops the person's free fall. The length of the band is adjusted so that the jumper just touches the surface of water below the bridge.

Suppose that a jumper of mass 60 kg makes a successful jump from the bridge from an initial height of 50 m above the water using band with an unstretched length of 30 m.

Answer the following questions based on the above given information.

13. The force constant of the elastic band is
(A) 100 N/m (B) 75 N/m (C) 300 N/m (D) 150 N/m

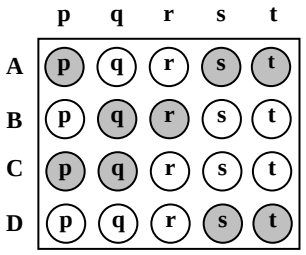
14. The maximum speed of the jumper during a jump is
(A) $\sqrt{640}$ m/s (B) $\sqrt{900}$ m/s (C) $\sqrt{320}$ m/s (D) $\sqrt{150}$N/m

15. If the jumper has a mass of 90 kg, then the unstretched length of the band must be
(A) greater than 30 m
(B) less than 30 m
(C)equal to 30 m
(D) adjustment of unstretched length of the band is independent of mass of the jumper

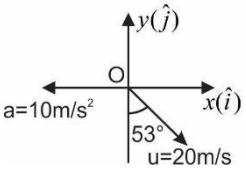
SECTION – B: Match the Column Type (One or More than one option Correct)

*This section contains 2 questions. Each question contains statements given in two columns which have to be matched. The statements in **Column I** are labelled A, B, C and D, while the statements in **Column II** are labelled p, q, r, s and t. Any given statement in **Column I** can have correct matching with **ONE OR MORE** statement(s) in **Column II.** The appropriate bubbles corresponding to the answers to these questions have to be darkened as illustrated in the following example:*

If the correct matches are A-p, s and t; B-q and r; C-p and q; and D-s and t; then the correct darkening of bubbles will look like the following.



1. A particle is moving on a smooth horizontal surface under the action of a constant force which provides a constant acceleration of $\vec{a}$ = 10 m/s^2($-\hat{i}$) to the particle. At some point O, the speed of the particle is 20 m/s in the direction shown in the figure. Taking point O as origin and defining $\hat{i}$ and $\hat{j}$ in the direction shown, match the statements in list – I with the statements in list – II.



List – I		List – II	
(A)	Radius of curvature of the path (in m) of the particle at point O is	(p)	64/5
(B)	Minimum speed of the particle (in m/s) during subsequent motion will be	(q)	12
(C)	Maximum distance of the particle (in m) from the y – axis before the particle crosses the y – axis for the first time will be	(r)	16/5
(D)	Time taken (in sec) by the particle to reach from point O to the point where it crosses the y – axis is	(s)	200/3

2. A bob of mass m = 1 kg is suspended from a fixed point by a string of length ℓ = 1 m. The bob is projected horizontally with a speed u = $\sqrt{6g\ell}$ (m/s), so as to perform a vertical circular motion. [Take g = 10 m/s^2]. Match the statements in list – I with the statements in list – II.

List – I		List – II	
(A)	The ratio of maximum to minimum tension in the string during the motion is	(p)	40
(B)	Tension (in Newton) in the string when the string becomes horizontal is	(q)	50
(C)	Magnitude of centripetal acceleration (in m/s^2) of the bob when the string makes an angle of 60^0 with the vertical, for the first time, is	(r)	3
(D)	If the string suddenly breaks when the string becomes horizontal for the first time, then the maximum height (in meters) reached by the bob (measured from the lowest position) is	(s)	7

PART – II :CHEMISTRY

SECTION – A : (Single Correct Answer Type)

This section contains **6 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct.**

1. Mass of $H_2C_2O_4$ required to reduce 100 ml of 0.008M $KMnO_4$ in acidic medium is x g and to neutralize 100 ml of 0.01 M $Mg(OH)_2$ is y g, then the relation between x and y is

   (A) x = y (B) x = 2y

   (C) 2x = y (D) x = 3y

2. A gas in an open container is heated from 27°C to 127°C. The fraction of the original amount of gas left in the container would be:

   (A) 3/4 (B) 1/2

   (C) 2/3 (D) 7/8

3. An electron is continuously accelerated in vacuum tube by applying potential difference. If its de-Broglie wavelength is decreased by 1%, the change in kinetic energy of the electron is nearly:

   (A) decreased by 1.0% (B) increased by 2.0%

   (C) increased by 1.0% (D) decreased by 2.0%

4. Select the group of species in which all show trigonal bipyramidal geometry:

   (A) PF_5, IF_5, XeF_4 (B) ClO_4^-, IF_7, CO_3^{2-}

   (C) I_3^-, XeF_2, SF_4 (D) XeF_6, PF_6^-, ICl_2^+

5. A quantity of hydrogen gas occupies a volume of 30 ml at a certain temperature and pressure. What volume would half of this mass of hydrogen occupy at triple the absolute temperature and the pressure were one ninth to that of original gas?

   (A) 405 ml (B) 810 ml

   (C) 81 ml (D) 225 ml

6. In which of the following pairs the two species are not isostructural?

   (A) PCl_4^+ and $SiCl_4$ (B) PF_5 and BrF_5

   (C) AlF_6^{3-} and SF_6 (D) CO_3^{2-} and NO_3^-

Space for rough work

(Assertion – Reason Type)

*This section contains **3 questions** numbered 7 to 9. Each question contains Statement – 1 (Assertion) and Statement – 2 (Reason). Each question has 4 choices (a), (b), (c) and (d) out of which **ONLY ONE** is correct.*

(A) Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1

(B) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1

(C) Statement-1 is True, Statement-2 is False

(D) Statement-1 is False, Statement-2 is True

7. **STATEMENT-1:** The value of Vander Waal's constant 'a' is larger for NH_3 than PH_3.

and

STATEMENT-2: Hydrogen bonding is present in NH_3.

8. **STATEMENT-1:** Bond order in a molecule can assume any value, positive or negative, integral or fractional including zero

because

STATEMENT-2: It depends upon the number of electrons in the bonding and antibonding orbitals.

9. **STATEMENT-1:** Electron gain enthalpy of oxygen is less than at of fluorine but greater than that of nitrogen

because

STATEMENT-2: Ionisation enthalpy is as follows: N > O > F

Space for rough work

(Paragraph Type)

This section contains **2 paragraphs. .**Based upon the each paragraph **3 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. 10 to 12

Dissolved oxygen in water is determined by using a redox reaction.

To the given sample of water containing dissolved oxygen, alkaline solution of Mn^{+2} and aqueous KI solution will be added. The iodine so liberated will be titrated with standard solution of hypo ($Na_2S_2O_3$).

Following equations describe the procedure:

I. $2Mn^{2+}(aq.) + 4OH^{-}(aq.) + O_2(g) \longrightarrow 2MnO_2(s) + 2H_2O(\ell)$

II. $MnO_2(s) + 2I^{-}(aq.) + 4OH^{-}(aq.) \longrightarrow Mn^{2+}(aq.) + I_2(aq.) + 2H_2O(\ell)$

III. $2S_2O_3^{2-}(aq.) + I_2(aq.) \longrightarrow S_4O_6^{2-}(aq.) + 2I^{-}(aq.)$

10. How many moles of $S_2O_3^{2-}$ are equivalent of each mole of O_2?

(A) 0.5 (B) 1

(C) 2 (D) 4

11. What amount of I_2 will be liberated from 8 g dissolved oxygen?

(A) 127 g (B) 254 g

(C) 504 g (D) 1008 g

12. If 3×10^{-3} mole O_2 is dissolved per litre of water then what will be the molarity of I^{-} produced in the given reaction?

(A) 3×10^{-3} M (B) $4 \times 3 \times 10^{-3}$ M

(C) $2 \times 3 \times 10^{-3}$ M (D) $1/2 \times 3 \times 10^{-3}$ M

Space for rough work

Paragraph for Question No. 13 to 15

On the basis of the postulates of kinetic theory of gases, it is possible to drive the mathematical expression, commonly known as kinetic gas equation.

$$PV = \frac{1}{3}mnu^2$$

where, P = Pressure of the gas,

V = Volume of the gas,

m = Mass of a molecule,

n = Number of molecules present in the given amount of a gas and

u = Root mean square speed

For one mole of the gas

PV = RT and n = N_A

$$\frac{1}{3}mN_A u^2 = RT$$

$$\frac{2}{3}.\frac{1}{2}m\,N_A u^2 = RT \qquad \left(\frac{1}{2}mN_A u^2 = \text{K.E. per mol}\right)$$

$$\frac{2}{3}\text{K.E.} = RT$$

$$\text{K.E.} \Rightarrow \frac{3}{2}RT$$

Average kinetic energy per mol does not depend on the nature of the gas but depends only on temperature. Thus, when two gases are mixed at the same temperature, there will be no rise or decrease in temperature unless both react chemically.

$$\text{Average kinetic energy per molecule} = \frac{\text{Average K.E. per mole}}{N}$$

$$= \frac{3}{2}\frac{RT}{N} \Rightarrow \frac{3}{2}KT$$

where, K is the Boltzmann constant.

13. Which of the following expressions correctly represents the relationship between the average molar kinetic energies of CO and N_2 molecules at the same temperature?

(A) KE(CO) = KE(N_2)

(B) KE(CO) > KE(N_2)

(C) KE(CO) < KE(N_2)

(D) Can not be predicted unless the volumes of the gases are given

14. Calculate the average kinetic energy in joule per molecule in methane at 27°C.

(A) 62.14×10^{-22} J (B) 72.68×10^{-21} J

(C) 68.2×10^{-21} J (D) 62.14×10^{-20} J

15. Which of the following is valid at absolute zero?

(A) Kinetic energy of the gas becomes zero but the molecular motion does not become zero

(B) Kinetic energy of the gas becomes zero and the molecular motion also becomes zero

(C) Kinetic energy of the gas decreases but does not become zero

(D) None of the above

SECTION – B: Match Column Type (One or More than one option Correct)

This section contains **two questions**, each having **two matching Columns**. Choices for the correct combination of elements from **Column-I** and **Column-II** are given as option (A), (B), (C) and (D) out of which **one or more than one** are correct.

1. Match the electronic transitions of Column – I with spectral properties of Column – II.

Column – I	Column – II
(A) $n = 6 \rightarrow n = 3$	(p) 10 lines in the spectrum
(B) $n = 7 \rightarrow n = 3$	(q) Spectral lines in visible region
(C) $n = 5 \rightarrow n = 2$	(r) 6 lines in the spectrum
(D) $n = 6 \rightarrow n = 2$	(s) Spectral lines in infrared region

2. Match the Column – I with Column – II.

Column – I (Compounds)	Column – II (Associated Uses)
(A) Na	(p) Most –ve reduction potential value
(B) K	(q) No flame colouration
(C) Be	(r) Thermally stable carbonate
(D) Li	(s) Golden yellow flame colouration

PART – III: MATHEMATICS

SECTION – A : (Single Correct Answer Type)

This section contains **6 multiple choice** questions. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

1. All chords of the curve $3x^2 - y^2 - 2x + 4y = 0$, that subtends a right angle at the origin, pass through a fixed point whose co-ordinate is
(A) (1, –2) (B) (1, 2) (C) (–1, 2) (D) (–1, –2)

2. Locus of the image of the point (2,3) in the line $(2x-3y+4)+K(x-2y+3)=0,\ k\in\mathbb{R}$, is a
(A) A circle of radius $\sqrt{2}$ (B) A straight line parallel to x axis
(C) A straight line parallel to y axis (D) A straight line neither parallel to x nor parallel to y axis

3. Let ABC be a triangle having orthocenter and circumcentre at (9,5) and (0,0) respectively. If the equation of side BC is $2x - y = 10$. Then coordinates of the vertex A is
(A) (1,9) (B) (1,7) (C) (2,9) (D) (1,–9)

4. The value of $\sin 55° - \sin 19° + \sin 53° - \sin 17°$ is always equal to
(A) $\cos 1°$ (B) $\sin 1°$ (C) $\sin 2°$ (D) $\cos 2°$

5. From the point A(0, 3) on $x^2 + 4x + (y-3)^2 = 0$, a chord AB is drawn and extended to a point M, such that AM = 2AB, then locus of M is
(A) $x^2 + y^2 - 8x - 6y + 9 = 0$ (B) $x^2 + y^2 + 8x - 6y + 9 = 0$
(C) $x^2 + y^2 + 8x + 6y + 9 = 0$ (D) $x^2 + y^2 - 8x + 6y + 9 = 0$

6. Two distinct chords drawn from the point (p, q)on the circle $x^2 + y^2 = px + qy$, where $pq \neq 0$, are bisected by the x-axis, then
(A) $|p| = |q|$ (B) $p^2 = 8q^2$ (C) $p^2 < 8q^2$ (D) $p^2 > 8q^2$

Reasoning Type

This section contains **3 reasoning** type questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

(A) Statement – 1 is true Statement – 2 is true ; statement-2 is a correct explanation for statement -1
(B) Statement – 1 is true Statement – 2 is true ; statement-2 is a NOT correct explanation for statement -1
(C)Statement – 1 is true, statement – 2 is false
(D) Statement – 1 is false, statement 2 is true

7. **Statement 1**: $\prod_{r=1}^{n}\left(1+\sec 2^r\theta\right) = \tan 2^n\theta \cot\theta$

Statement 2: $\prod_{r=1}^{n}\cos\left(2^{r-1}\theta\right) = \dfrac{\sin\left(2^n\theta\right)}{2^n \sin\theta}$

8. **Statement 1 :**The points (2, 1) and (–3,5) lie on opposite side of the line $3x - 2y + 1 = 0$
Statement 2 : The algebraic perpendicular distance from the given point to the line **have opposite sign**

9. **Statement 1 :** $\lim\limits_{x\to 0}\dfrac{\sin\left(\dfrac{1}{x}\right)}{\dfrac{1}{x}}=1$

Statement 2 : $\lim\limits_{x\to 0}\dfrac{\sin x}{x}=1$

Paragraph type (One Option Correct)

This section contains **TWO** paragraphs. Based on each paragraph, there will be **THREE** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONE of these four option(s) is correct**.

Paragraph for question Nos. 10 to 12

(i) Equation of the family of circles passing through the point of intersection of two given circles $S=0$ *and* $S'=0$ is given as $S+\lambda S'=0\left(\lambda\in\mathbb{R}-\{-1\}\right)$

(ii) The equation of the family of circles passing through the points of intersection of circle $S=0$ and a line $L=0$ is given as $S+\lambda L=0,\left(\lambda\in\mathbb{R}\right)$

(iii) The equation of the family of circles passing through the given points $P\left(x_1,y_1\right)$ and $Q\left(x_2,y_2\right)$ is given as

$$\left(x-x_1\right)^2+\left(y-y_1\right)^2+\lambda\left(\frac{y-y_1}{y_2-y_1}-\frac{x-x_1}{x_2-x_1}\right)=0\ \left(\lambda\in\mathbb{R}\right)$$

(iv) The equation of the family of circles which touch $y-y_1=m\left(x-x_1\right)$ at $\left(x_1,y_1\right)$ for any finite m is given as

$$\left(x-x_1\right)^2+\left(y-y_1\right)^2+\lambda\left[\left(y-y_1\right)-m\left(x-x_1\right)\right]=0,\ \left(\lambda\in\mathbb{R}\right)$$

10. The equation of the circle passing through the points of intersection of circles $x^2+y^2-2x-4y-4=0$ and $x^2+y^2-10x-12y+40=0$ and whose radius is 4 is

(A) $2x^2+2y^2-18x+22y+69=0$ (B) $x^2+y^2-2y-15=0$

(C) $x^2+y^2+2y-15=0$ (D) $2x^2+2y^2+18x-22y+69=0$

11. A variable circle which always touches the line $x+y-2=0$ at (1, 1) cuts the circle $x^2+y^2+4x+5y-6=0$ then the common chords of the variable circle and the given circle always passes through a fixed point, whose coordinates is

(A) $(1,1)$ (B) $\left(\dfrac{4}{3},0\right)$ (C) $(6,-4)$ (D) none of these

12. S_1 and S_2 be two circles passing through (0, 1) and (–2, 2) If radius of S_2 = $\sqrt{10}$ then equation S_2 is

(A) $x^2+y^2+2x-3y+2\pm\sqrt{7}\left(x+2y-2\right)=0$ (B) $x^2+y^2+2x-3y+2\pm\sqrt{11}\left(x+2y-2\right)=0$

(C) $x^2+y^2+2x-3y+2\pm\sqrt{5}\left(x+2y-2\right)=0$ (D) $x^2+y^2+2x-3y+2\pm\left(x+2y-2\right)=0$

Paragraph for question Nos. 13 to 15

Consider a triangle PQR with co-ordinates of its vertices as P(–8, 5), Q(–15, –19), R(1,–7). The bisector of the interior angle of P has the equation which can be written in the form $ax+2y+c=0$

13. The distance between the orthocentre and the circumcentre of the triangle PQR is

(A) $\dfrac{25}{2}$ (B) $\dfrac{29}{2}$ (C) $\dfrac{37}{2}$ (D) $\dfrac{51}{2}$

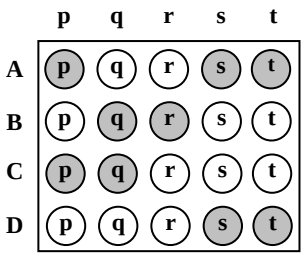
14. The radius of the incircle of the triangle PQRis
(A) 4 (B) 5 (C) 6 (D) 8

15. The sum a + c is
(A) 129 (B) 78 (C) 89 (D) 91

SECTION – B: Match the Column Type (One or More than one option Correct)

*This section contains 2 questions. Each question contains statements given in two columns which have to be matched. The statements in **Column I** are labelled A, B, C and D, while the statements in **Column II** are labelled p, q, r, s and t. Any given statement in **Column I** can have correct matching with **ONE OR MORE** statement(s) in **Column II.** The appropriate bubbles corresponding to the answers to these questions have to be darkened as illustrated in the following example:*

If the correct matches are A-p, s and t; B-q and r; C-p and q; and D-s and t; then the correct darkening of bubbles will look like the following.



16. Matrix Match Type

Column – 1	Column – 2
(A) If $\lim_{x\to\infty}\left[\frac{x^2+1}{x+2}-(ax+b)\right]=-3$ then $a+b=$	(P) 3
(B) Number of integers satisfying the inequality $\frac{(x^3+1)(x^3-1)}{x^{-4}}\le 0$ is	(Q) 2
(C) If $x=\sqrt{3}(1-\cos\theta)$ and $y=\sqrt{3}(\theta+\sin\theta)$ (where θ is a parameter), then the value of $-\frac{d^2y}{dx^2}$ at $\theta=\frac{\pi}{3}$ is L then $\frac{3}{2}$ L is	(R) 4
(D) Value of $\int_0^6(x-[x]dx$ is (where [x] represents greatest integer less than equal to x)	(S) 1

17. Matrix match Type 2

Column – 1	Column – 2
(A) If $x^2+y^2=1$ and $P=\left(3x-4x^3\right)^2+\left(3y-4y^3\right)^2$ the value of P is	(P) 1
(B) If $x=\frac{4k}{1+k^2}$ and $y=\frac{2-2k^2}{1+k^2}$ where k is real parameter, then x^2-xy+y^2 lies between $[a,b]$, then $a+b$ is	(Q) 2
(C) The value of $\sqrt{3}\operatorname{cosec}20^\circ-\sec 20^\circ$ is	(R) 4
(D) In a triangle ABC if $\tan A=\frac{1}{2}$, $\tan B=k+\frac{1}{2}$ and $\tan C=2k+\frac{1}{2}$, then possible value of $[k]$ is, (where [k] represents greatest integer less than or equal to k	(S) 8

Answer Key
PAPER -2

CLASS – 11, PHASE TEST – 1, B LOT

SET A

Part – I (PHYSICS)			Part – II (CHEMISTRY)			Part – III (MATHEMATICS)		
1.	**A**	(P110311)	1.		C113612	1.	**A**	M110733
2.	**A**	(P111645)	2.		C110203	2.	**A**	M110723
3.	**D**	(P110507)	3.		C111101	3.	**A**	M110734
4.	**B**	(P110321)	4.		C113509	4.	**A**	M111408
5.	**C**	(P110409)	5.		C110113	5.	**B**	M110724
6.	**B**	(P110420)	6.		C113015	6.	**D**	M110810
7.	**B**	(P111604)	7.		C113015	7.	**A**	M111409/M111410
8.	**B**	(P111622)	8.		C113506	8.	**A**	M110738
9.	**B**	(P110203)	9.		C110703	9.	**D**	M112406
10.	**A**	(P110411)	10.		C110105	10.	**B**	M110815
11.	**C**	(P110413)	11.		C110105	11.	**C**	M110818
12.	**A**	(P110507,P110502)	12.		C110105	12.	**A**	M110817
13.	**D**	(P110502)	13.		C110305	13.	**A**	M110707
14.	**A**	(P110502)	14.		C110305	14.	**B**	M110707
15.	**B**		15.		C110305	15.	**C**	M110707
16.	**(A)→s, (B)→q, (C)→p, (D)→r**	(P111605)	16.		C110207 C110208 C111101	16.	**A→Q B→Q C→Q D→P**	M112406 M112402 M112407 M112409
17.	**(A)→s, (B)→p, (C)→q, (D)→r**	(P110505)	17.		C113502 C113503	17.	**A→P B→S C→R D→Q**	M111412 M111409 M111406 M111309

CHEMISTRY (PART-II)

SECTION-A

1.	**B**	2.	**A**	3.	**B**	4.	**C**
5.	**A**	6.	**B**	7.	**A**	8.	**A**
9.	**C**	10.	**D**	11.	**A**	12.	**B**
13.	**A**	14.	**A**	15.	**B**		

SECTION-B

1. **(A) → (r, s); (B) → (p, s); (C) → (q, r); (D) → (p, q)**

2. **(A) → (r,s); (B) → (r); (C) → (q); (D) → (p)**