FIITJEE Phase Test (JEE-Advanced)

PHYSICS, CHEMISTRY & MATHEMATICS

Pattern - CPT-1 | **QP Code:** | **Test - 6**

Time Allotted: 3 Hours **Maximum Marks: 183**

- 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** 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 Only One Part.

(i) **Part-A (01-07) –** Contains seven (07) multiple choice questions which have **One or More** 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.

(ii) **Part-A (08-14) –** Contains seven (07) multiple choice questions which have ONLY ONE CORRECT answer Each question carries **+3 marks** for correct answer and **-1 marks** for wrong answer.

(iii) **Part-A (15-18) -** This section contains Two paragraphs. Based on each paragraph, there are Two multiple choice questions. Each question has only one correct answer and carries **+3 marks** for the correct answer and **-1 marks** for wrong answer.

Name of the Candidate :_____

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

Enrolment Number :_____

BATCHES – (2022) B & C Lot

SECTION-1 : PHYSICS

PART – A

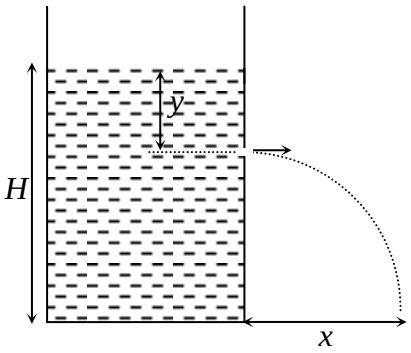
(Multi Correct Choice Type)

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

1. An incompressible fluid of density ρ flows steadily through a horizontal cylindrical pipe which has radius 2R at point A and radius R at point B further along the flow direction. If the velocity at point A is v, then
   (A) Velocity at the point B = 2V.
   (B) Velocity at the point B = 4V.
   (C) Pressure at the point A – pressure at the point B = $\frac{15}{2}\rho V^2$
   (D) Pressure at the point A – pressure at the point B = $3V^2$

1. **BC**

2. A tank, which is open at the top, contains a liquid up to a height H. A small hole is made in the side of the tank at a distance y below the liquid surface. The liquid emerging from the hole lands at a distance x from the tank
   (A) if y is increased from zero to H, x will first increase and then decrease.
   (B) x is maximum for y = H/2
   (C) the maximum value of x is H.
   (D) the maximum value of x will depend on the density of the liquid.

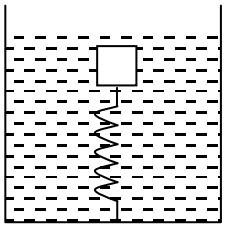


2. **ABC**

3. An object is floating in a liquid, kept in a container. The container is placed in a lift. Choose the correct option(s)
   (A) Buoyant force increases as lift accelerates up
   (B) Buoyant force decreases as lift accelerates up
   (C) Buoyant force remains constant as lift accelerates
   (D) The fraction of solid submerged into liquid does not change

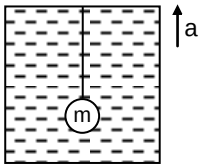
3. **AD**

4. A block of mass 'm' is attached by means of a spring to the bottom of a tank of water as shown in figure. At equilibrium, the spring is under compression. If the tank is now allowed to fall freely, then choose the correct alternative(s).
   (A) the spring comes to its relaxed position
   (B) the block will oscillate
   (C) the buoyant force becomes zero
   (D) there will be some elongation is the spring



4. **BC**

5. A simple pendulum has time period T_o say, when it is placed in a liquid the time period decreases. Then we need to move the point of suspension with a vertical acceleration a to regain the time period of simple pendulum. The ratio of densities of liquid and the bob is

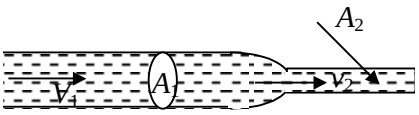


(A) $1 + \frac{a}{g}$ (B) $\frac{a}{g+a}$

(C) $\frac{g}{a}$ (D) none of these

5. **B**

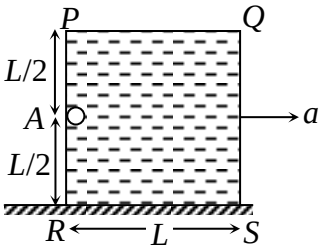
6. A liquid flows in a tube from left to right as shown in figure A_1 and A_2 are the cross-sections of the portions of the tube as shown. Then the ratio of speeds v_1/v_2 will be



(A) A_1/A_2 (B) A_2/A_1 (C) $\sqrt{A_2}/\sqrt{A_1}$ (D) $\sqrt{A_1}/\sqrt{A_2}$

6. **B**

7. A small solid ball of density ρ is held inside at point A a cubical container of side L, filled with an ideal liquid of density 4ρ as shown in the figure. Now, if the container starts moving with constant acceleration a horizontally and the ball is released from point A simultaneously, then



(A) For ball to hit the top of container at end Q, a = 3g.

(B) For ball to hit the top of container at end Q, a = 2g.

(C) Ball hits the top of container at end Q after a time $t = \sqrt{\frac{L}{3g}}$.

(D) Ball hits the top of container at end Q after a time $t = \sqrt{\frac{2L}{3g}}$.

7. **BC**

(Single Correct Choice Type)

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

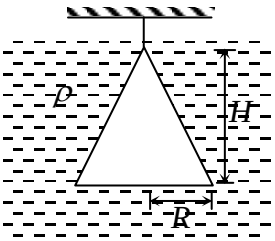
8. An ice is floating in water in a tank. As the ice melts, the level of water in the tank will

(A) rise (B) fall

(C) first rise then fall (D) remain unchanged

8. **D**

9. A solid cone of height *H*, radius *R* suspended by a string is just submerged in a liquid of density ρ such that tension in string is zero as shown in the figure. The magnitude of the net force applied by the liquid on the curved surface of the cone is equal to (atmospheric pressure is P_o)

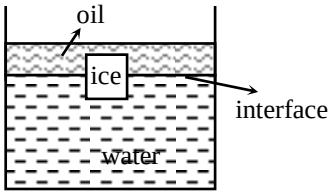


(A) $\frac{\pi R^2}{3}(2P_0 + \rho gH)$ (B) $\frac{\pi R^3}{3}(2P_0 + \rho gH)$

(C) $\frac{\pi R^2}{3}(3P_0 + 2\rho gH)$ (D) $\frac{\pi R^3}{3}(3P_0 + 2\rho gH)$

9. **C**

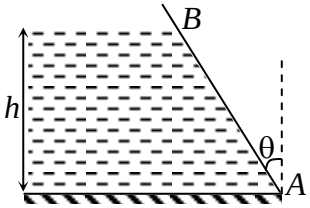
10. An ice cube is floating in water above which a layer of a lighter oil is poured. As the ice melts completely, the level of interface and the upper most level of oil will respectively



(A) rise and fall (B) fall and rise
(C) not change and not change (D) not change and fall

10. **A**

11. The height of water in a vessel is *h*. The vessel wall of width *b* is at an angle θ to the vertical. The net force exerted by the water on the wall is

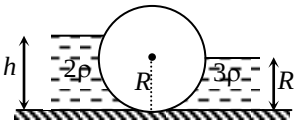


(A) $\frac{1}{3}\rho bgh^2g\cos\theta$ (B) $bh^2\rho g$

(C) $\frac{1}{2}\rho ph^2g\sec\theta$ (D) zero

11. **C**

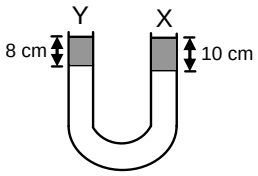
12. In the figure shown, the heavy cylinder (radius R) resting on a smooth surface separates two liquids of densities 2ρ and 3ρ. The height h for the equilibrium of cylinder must be



(A) $\frac{3R}{2}$ (B) $R\sqrt{\frac{3}{2}}$ (C) $R\sqrt{2}$ (D) $R\sqrt{\frac{3}{4}}$

12. **B**

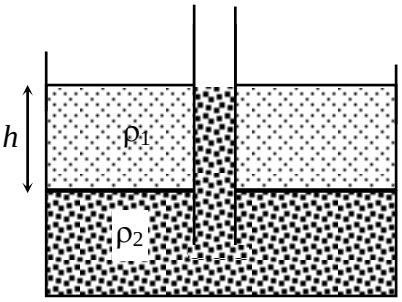
13. A liquid X of density 3.36 g/cm^3 is poured in a U-tube, which contains Hg. Another liquid Y is poured in left arm with height 8 cm. Upper levels of X and Y are same. What is density of Y?



(A) 0.8 gm/cc (B) 1.2 gm/cc
(C) 1.4 gm/cc (D) 1.6 gm/cc

13. **C**

14. A container has two immiscible liquids of densities ρ_1 and ρ_2 ($> \rho_1$). A capillary tube of radius r is inserted in the liquid so that its bottom reaches upto the denser liquid. The denser liquid rises in the capillary and attains a height h from the interface of the liquids, which is equal to the column length of the lighter liquid. Assuming angle of contact to be zero, the surface tension of heavier liquid is



(A) $2\pi r\rho_2 gh$ (B) $\frac{\rho_2 rgh}{2}$ (C) $\frac{r}{2}(\rho_2-\rho_1)gh$ (D) $2\pi r(\rho_2-\rho_1)gh$

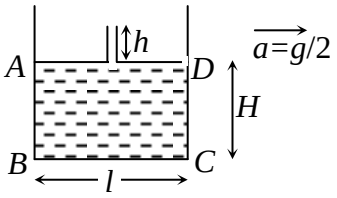
14. **C**

(Paragraph Type)

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

Paragraph for Question no. 15 to 16

A container of square base of side l and height H is completely filled with a liquid of density ρ. And it is closed with the help of a square plate AD of side l. This plate has a vertical tube of radius r and height h (volume of the tube is negligible as compared to volume of the liquid) at its centre and a small hole at D. Just after giving a horizontal acceleration a = g/2 (towards right), find out



15. Velocity of the liquid flowing out though the tube, if h < l/5 (neglect surface tension of the liquid)

(A) $\sqrt{gl}$ (B) $\sqrt{2g\left(\frac{l}{4}-h\right)}$ (C) $\sqrt{g\frac{l}{2}}$ (D) $\sqrt{2g\left(\frac{l}{2}-h\right)}$

15. **B**

16. Minimum height of the tube so that liquid does not come out of it, if surface tension of the liquid = T and contact angle $\theta = 0°$ is taken into consideration.

(A) $\frac{l}{4}-\frac{2T}{r\rho g}$ (B) $\frac{l}{2}+\frac{2T}{r\rho g}$ (C) $\frac{l}{4}+\frac{2T}{r\rho g}$ (D) $\frac{l}{2}-\frac{2T}{r\rho g}$

16. **A**

Paragraph for Question no. 17 to 18

Glass capillary of length 0.11 m is sealed at the upper end and having internal diameter 2×10^{-5}m. The capillary is immersed vertically into a liquid very slowly of surface tension 5.0×10^{-2} N/m in such a way that the liquid level inside and outside the capillary becomes same.

Answer the following questions based on the above statement. (atmospheric pressure $P_0 = 1.01 \times 10^5$ N/m, angle of contact zero)

17. What is the pressure of gas inside the tube after immersing into the liquid?

(A) 2.0606×10^5 N/m (B) 1.0606×10^5 N/m
(C) 1.01×10^5 N/m (d) none of these

17. **D**

18. To what length has the capillary to be immersed so that the liquid level inside and outside the capillary becomes same?

(A) 0.01 m (B) 0.02 m
(C) 0.03 m (D) 0.04 m

18. **A**

SECTION-2 : CHEMITRY

PART – A

(Multi Correct Choice Type)

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

1. $X_2(g) + Y_2(g) \longrightarrow 2XY(g) + 32\,kJ$

   In above reaction X_2, Y_2 and XY are present in their standard states. Choose correct statement(s)
   (A) it is an exothermic reaction
   (B) $\Delta_f H^o$ of XY = 16 kJ mol^{-1}
   (C) sum of bond energies of X_2 and Y_2 is greater than that of twice the bond energy of XY.
   (D) X_2, Y_2 and XY may contain multiple bonds.

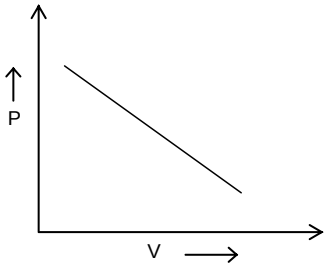
1. AD

2. Which of the following properties of boron are higher than that of its other group elements?
   (A) Stability of +3 oxidation state (B) Polarising power of +3 ion
   (C) Acidic strength of oxides (D) Electropositivity

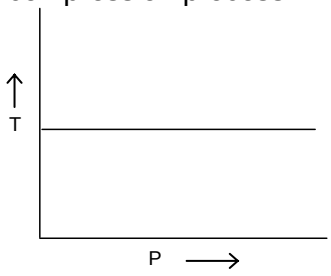
2. ABC

3. Which of the following graph(s) is/are correct for an ideal gas in a thermodynamical system which operates under reversible isothermal compression process?

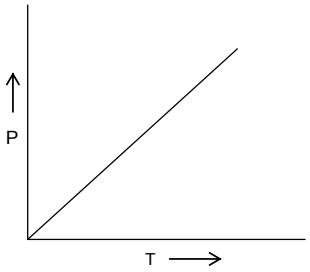
(A)



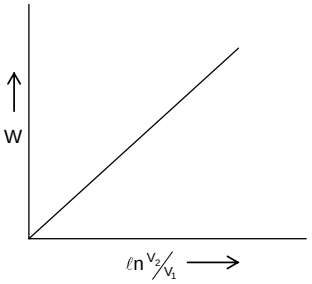
(B)



(C)



(D)



3. BD

4. The ion(s) present in the reaction mixture of $Al(OH)_3$ and HCl is/are
   (A) $[Al(OH)_6]^{3-}$ (B) $[AlCl_6]^{3-}$
   (C) $[Al(H_2O)_6]^{3+}$ (D) $[Al(OH)_4]^-$

4. C

5. Careful hydrolysis of $SiCl_4$ produces
   (A) $Cl_3Si - O - SiCl_3$ (B) $(Cl_3SiO)_2SiCl_2$
   (C) $Si(OH)_4Cl$ (D) $HSiCl_3$

5. AB

6. Which of the following is/are zero for a thermodynamic reversible process?
(A) ΔG (B) ΔS(total)
(C) ΔH (D) ΔE

6. AB

7. Correct statement(s) regarding the most stable graphite is/are
(A) all carbon atom are sp^2 hybridized
(B) each bond angle is 120^o
(C) electrical conduction is only observed within the plane
(D) when graphite is heated with potassium an ionic compound KC_8 is formed

7. ABCD

(Single Correct Choice Type)

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

8. $Al_2Cl_6 + NH_3 \longrightarrow Product(s)$

The product of above reaction is
(A) AlN and HCl (B) $AlCl_3.NH_3$
(C) $Al_2Cl_6.NH_3$ (D) AlN, $AlCl_3$ and HCl

8. B

9. $2P(g) + Q(g) \longrightarrow R(g) + S(g)$

The values of $\Delta_f H^o$ and S^o of the species of above reaction are given below

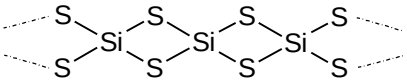
Species	P	Q	R	S
$\Delta_f H^o$ in kJ mol^{-1}	200	120	-80	800
S^o in JK^{-1} mol^{-1}	150	20	280	120

At which temperature the above reaction can be spontaneous?
(A) 2000 K (B) 2600 K
(C) 1850 K (D) data insufficient to predict

9. B

10. CO_4^{4-} does not exist SiO_4^{4-} exists, this is because of
(A) existence of vacant orbital in the valence shell of silicon
(B) Si – O^- bond is stronger than C – O^- bond
(C) electronegativity of carbon is higher than that of silicon
(D) smaller size of carbon atom than silicon

10. D

11. 

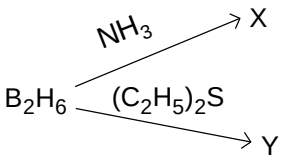
Hydrolysis of the above compound produces
(A) SiO_2 and H_2S (B) SiO_2 and H_2S_2
(C) $Si(SO_4)_3$ and H_2S_2 (D) $Si(SO_4)_2$ and H_2S

11. A

12. Which of the following reaction produces the same quantity of heat when it is measured at constant pressure or constant volume?
(A) $N_2(g) + O_2(g) \longrightarrow 2NO(g)$ (B) $2NO(g) + O_2(g) \longrightarrow 2NO_2(g)$
(C) $N_2O_4(s) \longrightarrow 2NO_2(g)$ (D) $NO(g) + NO_2(g) \longrightarrow N_2O_3(g)$

12. A

13.



In above reactions X and Y are

(A) X = $[H_2B(NH_3)_2]^+[BH_4]^-$, Y = $[H_2B((C_2H_5)_2S)_2]^+[BH_4]^-$

(B) X = $BH_3.NH_3$, Y = $[H_2B((C_2H_5)_2S)_2]^+[BH_4]^-$

(C) X = $[H_2B(NH_3)_2]^+[BH_4]^-$, Y = $BH_3.(C_2H_5)_2S$

(D) X = $BH_3.NH_3$, Y = $BH_3.(C_2H_5)_2S$

13. C

14. The standard heat of formation is zero for

(A) bromine water (B) bromine vapour

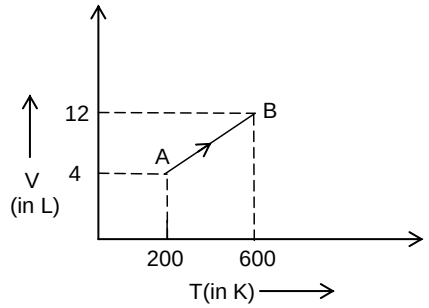
(C) bromine liquid (D) bromine in CCl_4

14. C

(Paragraph Type)

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

Paragraph for Question no. 15 to 16



$A \rightarrow B$ is a thermodynamical reversible process. The system contains one mole of an ideal gas. During operation the gas absorbs 2 Kcal mol^{-1} energy when heated from 200 K to 600 K. The volume of the system changes from 4 litre to 12 litre during the process.

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

15. The correct statement out of the following is

(A) the work done in the process is equal to the area under the line $A \rightarrow B$

(B) it is an isobaric process

(C) contraction of the ideal gas takes place during operation

(D) density of the gas increases during the process

15. B

16. The entropy change of the system(ΔS(system)) during the process in Cal K^{-1} mol^{-1} unit is

(A) 5.24 (B) 5.49

(C) 5.16 (D) 5.68

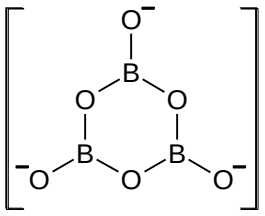
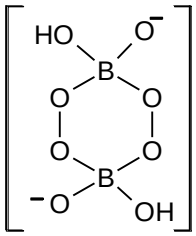
16. B

Paragraph for Question no. 17 to 18

Boron nitride is a polymer and exists in crystalline as well as amorphous forms. There are three crystalline forms namely h – BN, C – BN and W – BN. These forms have different structure with hexagonal, cubic and wurtzite type unit cells. It is a good thermal conductor. It is isoelectronic to carbon lattice. It is insoluble in acids and soluble in LiOH, NaOH, Na_2CO_3, Li_3N, Mg_3N_2 etc. Answer the following questions on the basis of above write up.

17. h – BN(hexagonal BN) is isoelectronic with which carbon lattice?
(A) Graphite (B) Diamond
(C) C_{60} (D) C_{70}

17. A

18. $BN + NaOH + H_2O \longrightarrow (P) + NH_3$
Product(P) is
(A) $Na_2^+B_4O_7^{2-}$ (B) $Na^+[B(OH)_4]^-$
(C) Na_3^+  (D) Na_2^+ 

18. B

SECTION-3 : MATHEMATICS

PART – A

(Multi Correct Choice Type)

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

1. Given that x_1, x_3 are roots of the equation $ax^2 - 4x + 1 = 0$ and x_2, x_4 are roots of the equation $bx^2 - 6x + 1 = 0$. If x_1, x_2, x_3, x_4 are in harmonic progression, then

(A) $3a - b = 1$ (B) $a^2 + b^2 = 73$

(C) $2a < 3b$ (D) $\frac{1}{a} > \frac{1}{b}$

1. **ABCD**

2. The normal at one extremity of latus rectum (in 1st quadrant) of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1, a > b > 0$ meets the rectangular hyperbola $xy = 9$ at points P and Q, then:

(A) If P is $\left(6, \frac{3}{2}\right) \Rightarrow$ Q is $\left(-\frac{3\sqrt{2}}{2}, -3\sqrt{2}\right)$

(B) Eccentricity of hyperbola is $\sqrt{2}$

(C) If P is $\left(6, \frac{3}{2}\right) \Rightarrow$ Q is $\left(-\frac{3e}{2}, -\frac{6}{e}\right)$ where e is eccentricity of the given ellipse

(D) If O is origin, then product of slopes of OP and OQ is positive

2. **BCD**

3. If the sum of first three numbers in A.P. is 24 and their product is 440, then S_n can be (S_n denotes sum of first n terms)

(A) $\frac{n}{2}[13 + 3n]$ (B) $\frac{n}{2}[19 - 3n]$

(C) $\frac{n}{2}[25 - 3n]$ (D) $\frac{n}{2}[3n + 7]$

3. **CD**

4. The equation (s) to common tangent(s) to the two hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ and $\frac{y^2}{a^2} - \frac{x^2}{b^2} = 1$ is/are:

(A) $y = x + \sqrt{a^2 - b^2}$ (B) $y = x - \sqrt{a^2 - b^2}$

(C) $y = -x + \sqrt{a^2 - b^2}$ (D) $y = -x - \sqrt{a^2 - b^2}$

4. **ABCD**

5. If S_n denotes the sum of first n terms of an Arithmetic progression and a_n denotes the n^{th} term of the same A.P. Given $S_n = n^2 p$; where k, p, $n \in N$ and $k \neq n$ then

(A) $a_1 = p$ (B) common difference $= 2p$

(C) $S_p = p^3$ (D) $a_p = 2p^2 - p$

5. **ABCD**

6. Straight line $Ax+By+D=0$ would be tangent to $xy=c^2$, if:

(A) $A>0,B>0$ (B) $A<0,B<0$

(C) $A>0, B<0$ (D) $A<0, B>0$

6. **AB**

7. x_1,x_2 are the roots of the equation $x^2-3x+A=0$; x_3,x_4 are roots of the equation $x^2-12x+B=0$, such that x_1,x_2,x_3,x_4 form an increasing G.P. then

(A) A = 2 (B) B = 32

(C) $x_1+x_3=5$ (D) $x_2+x_4=10$

7. **ABCD**

(Single Correct Choice Type)

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

8. AB is double ordinate of the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ such that ΔAOB (where 'O' is the origin) is an equilateral triangle, then the eccentricity e of the hyperbola satisfies:

(A) $e>\sqrt{3}$ (B) $1<e<\frac{2}{\sqrt{3}}$

(C) $e=\frac{2}{\sqrt{3}}$ (D) $e>\frac{2}{\sqrt{3}}$

8. **D**

9. For any $x,y\in R, xy>0$ then the minimum value of $\frac{2x}{y^3}+\frac{x^3y}{3}+\frac{4y^2}{9x^4}$ equals

(A) $2^{\frac{1}{3}}$ (B) 2

(C) $3^{\frac{1}{3}}$ (D) 3

9. **B**

10. The asymptote of the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ form with any tangent to the hyperbola a triangle whose area is $a^2\tan\lambda$ in magnitude then its eccentricity is:

(A) $\sec\lambda$ (B) $\operatorname{cosec}\lambda$

(C) $\sec^2\lambda$ (D) $\operatorname{cosec}^2\lambda$

10. **A**

11. Let $\alpha,\beta\in R$. If α,β^2 be the roots of quadratic equation $x^2-px+1=0$ and α^2,β be the roots of quadratic equation $x^2-qx+8=0$, then the value of 'r' if $\frac{r}{8}$ be arithmetic mean of p and q, is

(A) $\frac{83}{8}$ (B) $\frac{83}{4}$

(C) $\frac{83}{2}$ (D) 83

11. **D**

12. Locus of the middle point of the parallel chords with gradient m of the rectangular hyperbola $xy = c^2$ is:
(A) $y + mx = 0$ (B) $y - mx = 0$
(C) $my - x = 0$ (D) $my + x = 0$

12. **A**

13. Let g_n be the n^{th} term of the geometric progression of positive numbers.
If $\sum_{n=1}^{100} g_{2n} = \frac{10}{3}$ and $\sum_{n=1}^{100} g_{2n-1} = \frac{5}{9}$ then the common ratio of geometric progression, is
(A) 2 (B) 4
(C) 6 (D) 8

13. **C**

14. If the normal to the rectangular hyperbola $xy = c^2$ at the point 't' then t^3t_1 has the value equal to:
(A) 1 (B) –1
(C) 0 (D) none of these

14. **B**

(Paragraph Type)

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

Paragraph for Question no. 15 to 16

Consider an ellipse $\frac{x^2}{36} + \frac{y^2}{18} = 1$. There is a hyperbola whose one asymptote is major axis of given ellipse. If eccentricity of given ellipse and hyperbola are reciprocal to each other, both have same centre and both touch each other in first and third quadrant.

15. Focus of hyperbola is equal to:
(A) $\left(\frac{3}{2}, \frac{3}{2}\right)$ (B) $\left(\frac{3}{\sqrt{2}}, \frac{3}{\sqrt{2}}\right)$
(C) $\left(3\sqrt{2}, 3\sqrt{2}\right)$ (D) $\left[3\left(2^{3/4}\right), 3\left(2^{3/4}\right)\right]$

15. **D**

16. Number of points in x – y plane from where perpendicular tangents can be drawn to hyperbola:
(A) 0 (B) 1
(C) infinite (D) none of these

16. **A**

Paragraph for Question no. 17 to 18

Let the sum of first 10 terms of an arithmetic progression is equal to 155 and the first two terms of a geometric progression is 9. Also the first term of the arithmetic progression is equal to the common ratio of the geometric progression and the first term of the geometric progression is equal to the common difference of the arithmetic progression.

17. The common difference of arithmetic progression is

(A) $\frac{1}{2}, 3$ (B) $\frac{1}{3}, \frac{2}{3}$

(C) $\frac{1}{3}, 2$ (D) $\frac{2}{3}, 3$

17. **D**

18. The common ratio of geometric progression is

(A) $1, \frac{25}{2}$ (B) $2, \frac{25}{2}$

(C) 1, 2 (D) $\frac{1}{2}, \frac{2}{25}$

18. **B**

ANSWERS

SECTION-1 : PHYSICS

PART – A

SECTION – 2 : CHEMISTRY

PART – A

SECTION – 3 : MATHEMATICS

PART – A