

**FIITJEE COMMON TEST – V****PHYSICS, CHEMISTRY & MATHEMATICS****CODE: 124096****Time Allotted: 3 Hours****Maximum Marks: 186**

- 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 Section.
3. **Section-I** is Physics, **Section-II** is Chemistry and **Section-III** is Mathematics.
4. Each section is further divided into two parts: **Part-A & Part-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 HB pencil 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) **Part-A (01 – 05)** contains 5 multiple choice questions which have only one correct answer. Each question carries **+3 marks** for correct answer and **– 1 mark** for wrong answer.

**PART – A (06 – 13)** contains 8 Multiple Choice Questions which have **One or More Correct** answer.

For each question in the group **Q. 6 – 13** of **PART – A** you will be awarded

*Full Marks: +4* If only the bubble(s) corresponding to all the correct option(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-B (01-05)** contains five (05) Numerical based questions, the answer of which maybe positive or negative numbers or decimals (e.g. 6.25, 7.00, -0.33, -.30, 30.27, -127.30) and each question carries **+3 marks** for correct answer and **there will be no negative marking**.

**Name of the Candidate:** \_\_\_\_\_

**Batch:** \_\_\_\_\_ **Date of Examination:** \_\_\_\_\_

**Enrolment Number:** \_\_\_\_\_

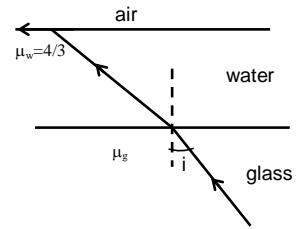
# SECTION – I: PHYSICS

## PART – A

(Single Correct Choice Type)

This section contains 5 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 is incident at an angle  $i$  at the glass water interface. It emerges finally parallel to the surface of water – air interface. Then the value of  $\mu_g$  would be



- (A)  $\frac{4}{3 \sin i}$  (B)  $\frac{1}{\sin i}$   
 (C)  $\frac{4}{3}$  (D) 1.5

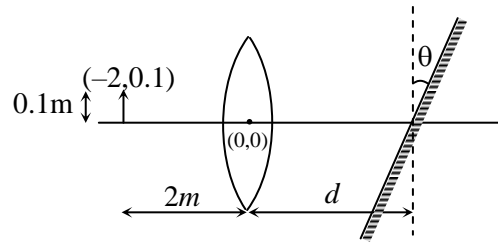
1. **B**

2. In a certain spectrum produced by a glass prism of dispersive power 0.0305, it is found that the refractive index for the red ray is 1.645 and that for the violet ray is 1.665. Then the refractive index for the yellow ray will be

- (A) 1.656 (B) 1.566 (C) 1.665 (D) none

2. **A**

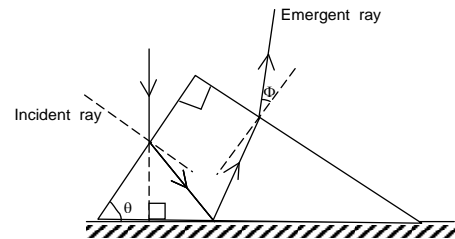
3. A convex lens of focal length 1.5m is placed in a system of coordinate axis such that its optical centre is at origin and principal axis coinciding with the x-axis. An object and a plane mirror are arranged on the principal axis as shown in figure. Find the value of  $d$  (in m) so that y-coordinate of final image (after refraction and reflection) is 0.3m. (Take  $\tan \theta = 0.3$ )



- (A) 2 (B) 3 (C) 4 (D) 5

3. **D**

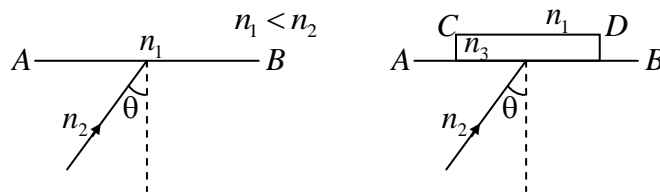
4. A light ray traveling in air is incident vertically on one face of a right angled prism with a refractive index  $\mu = \sqrt{3}$  as shown in the figure. If  $\theta = 60^\circ$  and the base of the prism is horizontal and silvered then the angle  $\phi$  made by emergent ray with the normal to the right face of the prism in degree will be



- (A) 0 (B) 30  
 (C) 60 (D) 90

4. **A**

5. In the figure light is incident at an angle  $\theta$  which is slightly greater than the critical angle. Now, keeping the incident angle fixed a parallel slab of refractive index  $n_3$  is placed on surface  $AB$ . Then choose the incorrect alternative.



- (A) total internal reflection occurs at  $AB$  for  $n_3 < n_1$   
 (B) total internal reflection occurs at  $AB$  for  $n_3 > n_1$   
 (C) the ray will return back to the same medium for all values of  $n_3$

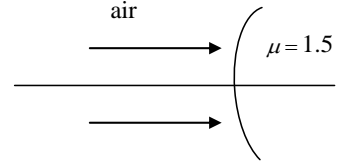
**COMMON TEST # 5 – C-XII-3**

- (D) total internal reflection occurs at CD for  $n_3 > n_1$   
 5. **B**

**(Multi Correct Choice Type)**

This section contains **8 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONE OR MORE** may be correct.

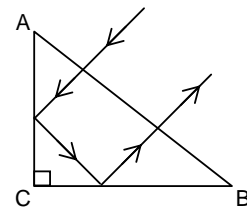
6. Parallel rays of light are falling on convex spherical surface of radius of curvature  $R = 20$  cm. Refractive index of the medium is  $\mu = 1.5$ . After refraction from the spherical surface parallel rays :



- (A) actually meet at some point  
 (B) appears to meet after extending the refracted rays backwards  
 (C) meet (or appears to meet) at a distance of 30 cm from the spherical surface  
 (D) meet (or appears to meet) at a distance of 60 cm from the spherical surface

6. **AD**

7. A ray of light incident normally on face AB of an isosceles prism as shown in figure. The value of the RI the prism may have



- (A)  $\sqrt{2}$  (B)  $\sqrt{1.5}$   
 (C)  $\sqrt{3}$  (D) 2.0

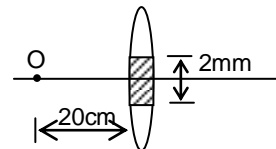
7. **ACD**

8. A concave lens of glass, refractive index 1.5 has both surfaces of same radius of curvature  $R$ . On immersion in a medium of refractive index 1.75, it will

- (A) behave as a convergent lens (B) behave as a divergent lens  
 (C) have focal length  $3.5 R$  (D) have focal length  $3 R$

8. **AC**

9. A convex lens of focal length 10 cm is painted black at the middle portion as shown in figure. An object is placed at a distance of 20 cm from the lens. Then



- (A) only one image will be formed by the lens.  
 (B) two images are formed and distance between them is 6 mm.  
 (C) two images are formed and distance between them is 4 mm.  
 (D) image formation will be of real type and not virtual.

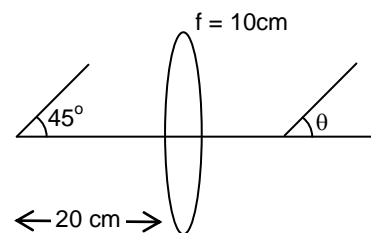
9. **AD**

10. A circular beam of light of diameter  $d = 2$  cm falls on a plane surface of glass. The angle of incidence is  $60^\circ$  and refractive index of glass is  $\mu = 3/2$ . The diameter of the refracted beam just after refraction will be

- (A) 3.26 cm (B) 2.52 cm  
 (C) refracted beam will be diverging beam (D) refracted beam will be parallel beam

10. **AD**

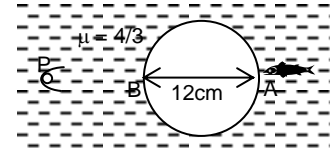
11. An object starts moving at an angle of  $45^\circ$  with the principle axis as shown in the figure in front of a biconvex lens of focal length  $+ 10$  cm. If  $\theta$  denotes the angle at which image starts moving with principal axis then



- (A)  $|\theta| = \frac{\pi}{2}$   
 (B)  $|\theta| = \frac{\pi}{4}$

**COMMON TEST # 5 – C-XII-4**

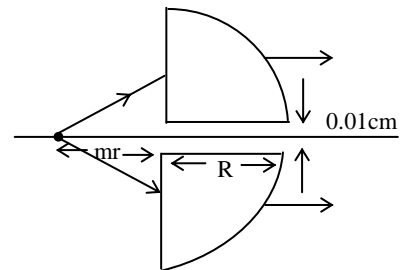
- (C) image starts moving above principle axis.  
 (D) image starts moving below principle axis.
11. **BD**
12. A small fish touching the surface of spherical air bubble is observed from opposite surface from point P. The diameter of bubble is 12 cm. (Refractive index of water is  $4/3$ ). The location of image of fish, assuming B as origin is  
 (A) 4.8 cm  
 (B) 9.6 cm  
 (C) fish will appear to touch the surface of bubble  
 (D) fish will appear to be inside the bubble
12. **BC**
13. A student performed the experiment of determination of focal length of a concave mirror by u–v method using an optical bench of length 1.5 M. The focal length of the mirror used is 24 cm. The maximum error in the location of the image can be 0.2 cm. The 5 sets of (u, v) values recorded by the student (in cm) are (42, 56), (48, 48), (60, 40), (66, 33) and (78, 39). The data sets that cannot come from experiment and are incorrectly recorded are  
 (A) (42, 56) (B) (48, 48)  
 (C) (66, 33) (D) (78, 39)
13. **CD**



**PART – C**  
**(Integer Type)**

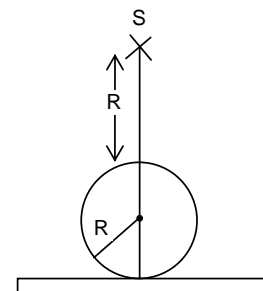
This section contains **5 questions**. The answer to each question is a **single-digit integer**, ranging from 0 to 9. The correct digit below the question number in the ORS is to be bubbled.

1. A quarter cylinder of radius R and refractive index 1.5 is placed on two sides a table. A point object P is kept at a distance of mR from it. If the value of m for which a ray from P will emerge parallel to the table as shown in figure, is  $\frac{x}{3}$ , then x = (the distance between two half is 0.01 cm)



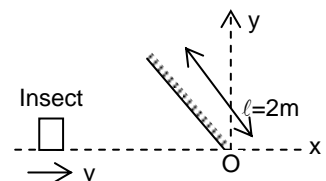
1. **4**

2. An opaque sphere of radius R lies on a horizontal plane. On the perpendicular line through the point of contact, there is a point source of light at a distance R above the sphere. The area of the shadow on the plane is  $k\pi R^2$ , then k is



2. **3**

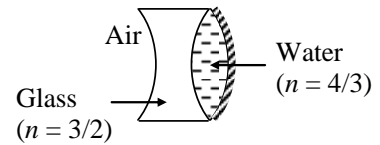
3. A plane mirror of length 2 m is kept along the line  $y = -x$  as shown in the figure. An insect having velocity of  $4\hat{i}$  cm/s is moving along the x-axis. The time span for which the insect can see its image is  $\frac{100\sqrt{2}}{n}$  sec then 'n' is



3. **2**

COMMON TEST # 5 – C-XII-5

4. The radius of curvature of the left and right surface of the concave lens are 10 cm and 15 cm respectively. The radius of curvature of the mirror is 15 cm. The equivalent focal length of the combination is \_\_\_\_\_ in meters.



4. **-0.18**
5. The distance between a screen and an object is 120 cm. A convex lens is placed close to the object and is moved along the line joining object and screen, towards the screen. Two sharp images of the object are found on the screen. The ratio of magnification of two real images is 1 : 9. Then, focal length of the lens is \_\_\_\_\_ cm.
5. **22.50**

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*Space for rough work*

**SECTION – II: CHEMISTRY****PART – A****(Single Correct Choice Type)**

This section contains **5 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct**.

- Which of the following solutions has minimum freezing point?  
(assume complete dissociation of salts)  
(A) 0.01 M NaCl (B) 0.005 M C<sub>2</sub>H<sub>5</sub>OH  
(C) 0.005 M MgCl<sub>2</sub> (D) 0.005 MgSO<sub>4</sub>
- A
- Which of the following solutions show negative deviation from Raoult's law?  
(A) Benzene + Toluene (B) Phenol + Aniline  
(C) Ethanol + Water (D) Ethanol + cyclohexane
- B
- When MnO<sub>2</sub> is fused with KOH, a coloured compound is formed. The product and its colour is  
(A) K<sub>2</sub>MnO<sub>4</sub>, green (B) Mn<sub>2</sub>O<sub>3</sub>, brown  
(C) Mn<sub>2</sub>O<sub>4</sub>, black (D) KMnO<sub>4</sub>, purple
- A
- Manganese(Mn<sup>2+</sup>) ions can be oxidized by persulphate ions S<sub>2</sub>O<sub>8</sub><sup>2-</sup> according to the following half equations  
$$S_2O_8^{2-} + 2e^- \longrightarrow 2SO_4^{2-}$$
$$Mn^{2+} + 4H_2O \longrightarrow MnO_4^- + 8H^+ + 5e^-$$
  
How many moles of S<sub>2</sub>O<sub>8</sub><sup>2-</sup> are required to oxidize 1 mol of Mn<sup>2+</sup>?  
(A) 2.5 (B) 2.0  
(C) 11.0 (D) 0.4
- A
- What is wrong about the compound K[Pt(η<sup>2</sup>-C<sub>2</sub>H<sub>4</sub>)Cl<sub>3</sub>]?  
(A) It is called Ziese's salt (B) It is π-bonded complex  
(C) Oxidation number of Pt is +4 (D) Four ligands surrounded the platinum ion
- C

**(Multi Correct Choice Type)**

This section contains **8 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONE OR MORE** may be correct.

- Identify the statement which is correct for copper sulphate.  
(A) It reacts with NaOH and glucose to give Cu<sub>2</sub>O (brick red ppt)  
(B) It reacts with KCl to give Cu<sub>2</sub>Cl  
(C) It gives CuO on strong heating  
(D) It reacts with KI to give I<sub>2</sub>
- ACD

COMMON TEST # 5 – C-XII-7

7. Which are correct statements?  
(A)  $[\text{Ag}(\text{NH}_3)_2]^+$  is linear with sp hybridized  $\text{Ag}^+$  ion.  
(B)  $\text{NiCl}_4^{2-}$ ,  $\text{VO}_4^{3-}$  and  $\text{MnO}_4^-$  have tetrahedral geometry.  
(C)  $[\text{Cu}(\text{NH}_3)_4]^{2+}$ ,  $[\text{Pt}(\text{NH}_3)_4]^{2+}$  and  $[\text{Ni}(\text{CN})_4]^{2-}$  have  $\text{dsp}^2$  hybridisation of the metal.  
(D)  $[\text{Fe}(\text{CO})_5]$  has trigonal bipyramidal structure with  $\text{dsp}^3$  hybridised iron.
7. ABCD
8. Both geometrical and optical isomerism are shown by  
(A)  $[\text{Co}(\text{en})_2\text{Cl}_2]^+$  (B)  $[\text{Co}(\text{NH}_3)_5\text{Cl}]^{2+}$   
(C)  $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$  (D)  $[\text{Cr}(\text{OX})_3]^{3-}$
8. A
9. Consider the following solutions  
I. 1 M sucrose II. 1 M KCl  
III. 1 M benzoic acid in benzene IV. 1 M  $(\text{NH}_4)_3\text{PO}_4$   
Which of the following is/are true?  
(assume complete dissociation of salts)  
(A) All solutions are isotonic (B) III is hypotonic of I, II and IV  
(C) I, II and III are hypertonic of IV (D) IV is hypertonic of I, II and III
9. BD
10. 2L of 1 molar solution of a complex salt  $\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$  ( $M_w = 266.5$ ) shows an osmotic pressure of 98.52 atm at  $27^\circ\text{C}$ . The solution is treated with 1 L of 6 M  $\text{AgNO}_3$ , which of the following are correct?  
(A) Weight of  $\text{AgCl}$  precipitated is 861 g  
(B) The clear solution will show an osmotic pressure of 98.52 atm  
(C) The clear solution will show an osmotic pressure of 65.68 atm  
(D) 2 mol of  $[\text{Cr}(\text{H}_2\text{O})_6](\text{NO}_3)_3$  will be present in the solution
10. ACD
11. Which of the following statement is/are correct?  
(A) The freezing point of water is depressed by the addition of glucose.  
(B) The degree of dissociation of weak electrolyte decreases as its concentration decreases  
(C) Energy is released when a substance dissolves in water provided that the hydration energy of the substance is more than its lattice energy  
(D) If two liquids that form an ideal solution are mixed, the change in entropy is positive
11. ACD
12. The correct statement(s) about surface properties is(are)  
(A) Adsorption is accompanied by decrease in enthalpy and decrease in entropy of the system.  
(B) The critical temperatures of ethane and nitrogen are 563 K and 126 K, respectively. The adsorption of ethane will be more than that of nitrogen on same amount of activated charcoal at a given temperature.  
(C) Cloud is an emulsion type of colloid in which liquid is dispersed phase and gas is dispersion medium.  
(D) Brownian motion of colloidal particles does not depend on the size of the particles but depends on viscosity of the solution.
12. ABC

**COMMON TEST # 5 – C-XII-8**

13. Tyndall effect is applicable when  
(A) the diameter of the dispersed particle is not much smaller than the wavelength of the light used.  
(B) the diameter of the dispersed particle is much smaller than the wavelength of the light used.  
(C) the refractive indices of the dispersed phase and the dispersion medium must be same.  
(D) the refractive indices of the dispersed phase and the dispersion medium must differ greatly in magnitude.

13. AD

**PART – C**  
**(Integer Type)**

This section contains **5 questions**. The answer to each question is a **single-digit integer**, ranging from 0 to 9. The correct digit below the question number in the ORS is to be bubbled.

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1. The number of CO groups bonded in between the Fe atoms in  $\text{Fe}_2(\text{CO})_9$  are  
1. 3
2. Number of elements that generally do not show variable oxidation state of the following are Cu, Zn, Au, Cd, Sc, La, Pt, Co  
2. 4
3. The Van't Hoff factor for  $\text{K}_4[\text{Fe}(\text{CN})_6]$  if degree of dissociation is 50% is  
3. 3
4. The osmotic pressure of a solution containing 40 g of solute (molecular mass 246) per litre at  $27^\circ\text{C}$  is  $x$  atm ( $R = 0.0822 \text{ atm L mol}^{-1} \text{ K}^{-1}$ ). The  $x$  is  
4. 4
5. Number of unpaired electrons in  $t_{2g}$  set of d-orbital in the complex  $[\text{Co}(\text{H}_2\text{O})_3\text{F}_3]$  are  
5. 2
- 

*Space for rough work*



**SECTION – III: MATHEMATICS****PART – A****(Single Correct Choice Type)**

This section contains **5 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

1. The solution of the differential equation  $y'(y^2 - x) = y$  is  
 (A)  $y^3 - 3xy = C$  (B)  $y^3 + 3xy = C$   
 (C)  $x^3 - 3xy = C$  (D)  $y^3 - xy = C$
1. A
2. The area (in sq. units) bounded by  $y = x^2 + 3$  and  $y = 2x + 3$  is  
 (A)  $\frac{12}{7}$  (B)  $\frac{4}{3}$   
 (C)  $\frac{3}{4}$  (D)  $\frac{8}{3}$
2. B
3.  $\left(\frac{d^2y}{dx^2}\right)^2 + x\left(\frac{dy}{dx}\right)^3 = 0$  is a differential equation of  
 (A) degree 2, order 2 (B) degree 3, order 3  
 (C) order 2, degree 3 (D) None of these
3. A
4. If A and B are two square matrices of same order, then which of the following is incorrect?  
 (A)  $A + B = B + A$  (B)  $A(A + B) = A^2 + AB$   
 (C)  $(A + B)^2 = A^2 + AB + BA + B^2$  (D)  $A^2 - B^2 = (A + B)(A - B)$
4. D
5. The area of the region  $R = \{(x, y) : |x| \leq y \text{ \& } x^2 + y^2 \leq 1, x, y \in \mathbb{R}\}$ , (in sq units) is  
 (A)  $\frac{3\pi}{8}$  (B)  $\frac{\pi}{4}$  (C)  $\frac{\pi}{2}$  (D)  $\frac{\pi}{8}$
5. B

**(Multi Correct Choice Type)**

This section contains **8 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONE OR MORE** may be correct.

6. Consider a curve passing through (1, 1) such that perpendicular distance of the normal drawn at any point P from origin is equal to the ordinate of point P. Which of the following statements are **CORRECT**?  
 (A) The curve passes through origin  
 (B) The equation of tangent at (2, 0) is  $x = 2$   
 (C) The differential equation of the curve is  $\frac{dy}{dx} = \frac{y^2 - x^2}{2xy}$   
 (D) The differential equation of the curve is  $\frac{dy}{dx} = \frac{x^2 - y^2}{2xy}$
6. ABC

**COMMON TEST # 5 – C-XII-10**

7. In which of the following differential equation degree is not defined?

(A)  $\frac{d^2y}{dx^2} + 3\left(\frac{dy}{dx}\right)^2 = x \log \frac{d^2y}{dx^2}$

(B)  $\left(\frac{d^2y}{dx^2}\right)^2 + \left(\frac{dy}{dx}\right)^2 = x \sin\left(\frac{d^2y}{dx^2}\right)$

(C)  $x = \sin\left(\frac{dy}{dx} - 2y\right), |x| < 1$

(D)  $x - 2y = \log\left(\frac{dy}{dx}\right)$

7. **AB**

8. If differential equation of the curve  $y = ae^{3x} + be^{2x} + ce^x$  is  $\frac{d^3y}{dx^3} + m\frac{d^2y}{dx^2} + n\frac{dy}{dx} + py = 0$  then,

(A)  $(m+n)$  is a prime number

(B)  $(m-n)$  is always divisible by any odd number

(C)  $m+n+p$  is a negative integer

(D)  $|m|$  is divisible by two prime numbers

8. **ABCD**

9. Which of the following is an upper triangular matrix?

(A)  $\begin{bmatrix} 2 & 0 & 0 \\ 1 & -4 & 0 \\ 0 & 3 & 0 \end{bmatrix}$

(B)  $\begin{bmatrix} 2 & -2 & -1 \\ 0 & 1 & 3 \\ 0 & 0 & 0 \end{bmatrix}$

(C)  $\begin{bmatrix} 4 & -3 & 6 \\ 0 & -3 & 5 \\ 0 & 0 & 2 \end{bmatrix}$

(D)  $\begin{bmatrix} 7 & 0 & 0 \\ -1 & 0 & 0 \\ -2 & 0 & -1 \end{bmatrix}$

9. **BC**

10. Which of the following pairs have the same bounded area?

(A)  $f(x) = \sin x, g(x) = \sin^2 x$ , where  $0 \leq x \leq 10\pi$

(B)  $f(x) = \sin x, g(x) = |\sin x|$ , where  $0 \leq x \leq 20\pi$

(C)  $f(x) = |\sin x|, g(x) = \sin^3 x$ , where  $0 \leq x \leq 10\pi$

(D)  $f(x) = \sin x, g(x) = \sin^4 x$ , where  $0 \leq x \leq 10\pi$

10. **ACD**

11. Let S be the area of the region enclosed by  $y = e^{-x^2}$ ,  $x = 0$ ,  $y = 0$  and  $x = 1$ . Then

(A)  $S \geq \frac{1}{e}$

(B)  $S \geq 1 - \frac{1}{e}$

COMMON TEST # 5 – C-XII-11

(C)  $S \leq \frac{1}{4} \left( 1 + \frac{1}{\sqrt{e}} \right)$

(D)  $S \leq \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{e}} \left( 1 - \frac{1}{\sqrt{2}} \right)$

11. ABD

12. The area of the region bounded by the curve  $y = x^2 - x$  and the line  $y = mx$  is equal to  $\frac{9}{2}$  sq.units . Then m can be

(A) -4

(B) -2

(C) 2

(D) 4

12. BD

13. Let 'a' be a positive constant number. Consider the curves  $C_1 : y = e^x$ ,  $C_2 : y = e^{a-x}$ . Let S be the area of the region bounded by  $C_1$ ,  $C_2$  and y-axis. Then

(A)  $\lim_{a \rightarrow \infty} S = 1$

(B)  $\lim_{a \rightarrow 0^+} \frac{S}{a^2} = \frac{1}{4}$

(C) Range of S is  $[0, \infty)$

(D)  $S(a)$  is neither even nor odd

13. ABCD

**PART – C**  
**(Integer Type)**

This section contains **5 questions**. The answer to each question is a **single-digit integer**, ranging from 0 to 9. The correct digit below the question number in the ORS is to be bubbled.

1. A matrix B has 12 elements. The number of possible orders of matrix B is  
1. 6

2. The area of the region bounded by  $y = |x - 2|$ ,  $x = 1$ ,  $x = 3$  and x-axis is (in sq. units)  
2. 1

3. If  $y = e^{(k+1)x}$  is a solution of  $\frac{d^2y}{dx^2} - 4 \frac{dy}{dx} + 4y = 0$ , then k is equal to  
3. 1

4. The order and degree of  $\sqrt[3]{\frac{dy}{dx}} - 4 \frac{d^2y}{dx^2} - 7x = 0$  are a and b respectively. Then a+b equals  
4. 5

5. For  $A = \begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}$  and  $B = \begin{bmatrix} b & 1 \\ a & -1 \end{bmatrix}$ , if  $(A+B)^2 = A^2 + B^2$ , then a - b is equal to  
5. 3

*Space for rough work*