FIITJEE – JEE (Main)

BATCHES –NWCM2022-A-Iot_PT5

Physics, Chemistry & Mathematics

QP Code:

Time Allotted: 3 Hours **Maximum Marks: 300**

- 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.

Important 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. Each **Section** is further divided into **Two Parts**: **Part-A & B** in the OMR.
5. Rough spaces are provided for rough work inside the question paper. No additional sheets will be provided for rough work.
6. No candidate is allowed to carry any textual material, printed or written, bits of papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices ext. except the Admit Card inside the examination hall / room.

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.
4. **Do not fold or make any stray marks on the Answer Sheet.**

C. Marking Scheme for All Two Parts:

(i) **Part-A (01-20) –** Contains Twenty (20) multiple choice objective questions which have four (4) options each and only one correct option. Each question carries **+4 marks** which will be awarded for every correct answer and **-1 mark** will be deducted for every incorrect answer.

(ii) **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 **+4 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 Questions

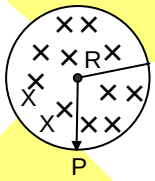
This section contains 20 Single Correct Questions out of which only one option is correct

1. If a dc of value of I amp is superimposed on an alternating current $i = I_0 \sin \omega t$ flowing through a wire, the effective value of the resulting current in the circuit is

(A) $\left(I^2 + I_0^2\right)^{1/2}$ (B) $\left(I_0^2 + \frac{I^2}{2}\right)^{1/2}$ (C) $\left[I^2 + \frac{1}{2}I_0^2\right]^{1/2}$ (D) $\left(I + \frac{I_0}{2}\right)^{1/2}$

1. **C**

2. A uniform magnetic field of induction B is confined to a cylindrical region of radius R. The magnetic field is increasing at the rate of $\left(\frac{dB}{dt}\right)$ (tesla/sec).



An electron of charge e, placed at point P on the periphery of the field experiences an initial acceleration of

(A) $\frac{1}{2}\frac{eR}{m}\frac{dB}{dt}$ towards left (B) $\frac{1}{2}\frac{eR}{m}\frac{dB}{dt}$ towards right

(C) $\frac{eR}{m}\frac{dB}{dt}$ towards left (D) zero

2. **A**

3. A bulb of 100 W is connected in parallel with an ideal inductance of 1 H. This arrangement is connected to a 90 V battery through a switch. On Pressing the switch, the
(A) bulb does not glow
(B) bulb glows at a constant brightness at all times.
(C) bulb glows after a short time and then continues to glow
(D) bulb glows for a short time and then stops glowing

3. **D**

4. Lenz's law is a consequence of
(A) conservation of momentum (B) conservation of current
(C) conservation of charge (D) conservation of energy

4. **D**

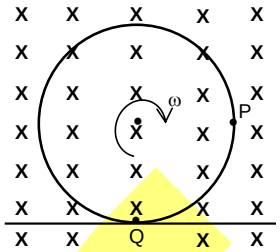
5. A circular loop of radius r, having N turns of wire, is placed in a uniform magnetic field B. The normal of the loop makes an angle θ with magnetic field. Its normal rotates with an angular velocity ω in such a way that it maintains a constant angle θ with the field at all times . The average emf appearing in loop in one rotation is :

(A) $\frac{NB\omega r^2}{2}$ (B) $\frac{NB\omega r^2}{2}\cos\theta$

(C) $N\omega Br^2$ (D) zero

5. **D**

6. A conducting ring of radius 'r' is rolling without slipping with a constant angular velocity ω. If the magnetic field strength is B and is directed into the page, then emf induced across PQ is



(A) $\frac{B\omega r^2}{2}$ (B) $B\omega r^2$

(C) $4B\omega r^2$ (D) $\frac{B\omega r^2}{4}$

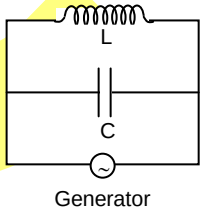
6. **B**

7. An inductor coil stores energy U when a current i is passed through it and dissipates energy at the rate of P. The time constant of the circuit when this coil is connected across a battery of zero internal resistance is

(A) $\frac{4U}{P}$ (B) $\frac{U}{P}$ (C) $\frac{2U}{P}$ (D) $\frac{2P}{U}$

7. **C**

8. For the circuit shown in the figure, the current through the inductor is 0.6 A, while the current through the capacitor is 0.4 A. The current drawn from the generator is



(A) 1.0 A (B) 0.4 A
(C) 0.6 A (D) 0.2 A

8. **D**

9. A proton has kinetic energy E=100 ke V which is equal to that of a photon. The wavelength of photon is λ_2 and De Broglei wavelength of proton is λ_1. The ration of λ_2/λ_1 is proportional to

(A) E^2 (B) $E^{1/2}$
(C) E^{-1} (D) $E^{-1/2}$

9. **D**

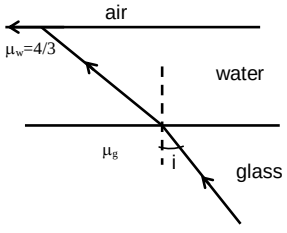
10. Magnetic flux through a circuit of resistance R changes by an amount $\Delta\phi$ in a time Δt. Total quantity of electric charge Q that passes through any point in the circuit during the time Δt is represented by

(A) $Q = \frac{1}{R}\frac{\Delta\phi}{\Delta t}$ (B) $Q = \frac{\Delta\phi}{R}$

(C) $Q = \frac{\Delta\phi}{\Delta t}$ (D) $Q = R\frac{\Delta\phi}{\Delta t}$

10. **B**

11. 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 μ_g would be



(A) $\frac{4}{3\sin i}$ (B) $\frac{1}{\sin i}$

(C) $\frac{4}{3}$ (D) 1.5

11. **B**

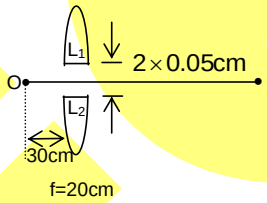
12. Two coherent sources of intensity ratio 100:1, interfere what is the (approximate) ratio of the intensity between the maxima and minima in the interference pattern?
(A) 10:1 (B) 5:2 (C) 3:2 (D) 11:9

12. **C**

13. The work function of metal is 1 eV. Light of wavelength 3000 Å is incident on this metal surface. The maximum kinetic energy of emitted photo-electrons will be
(A) 4.13 eV (B) 3.13 eV (C) 2.13 eV (D) None of these

13. **B**

14. A point object O is placed at a distance of 0.3 m from a convex lens (focal length 0.2 m) cut into two halves each of which is displaced by 0.0005 m as shown in figure. The distance between the images formed is :



(A) 1 mm (B) 2 mm
(C) 3 mm (D) 4 mm

14. **C**

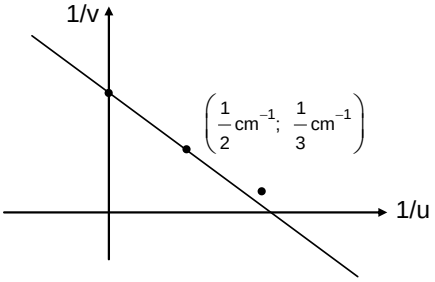
15. When a thin transparent sheet of refractive index $\mu = \frac{3}{2}$ is placed near one of the slits in Young's double slits experiment, the intensity at the centre of the screen reduces to half of the maximum intensity. The minimum thickness of the sheet should be
(A) $\frac{\lambda}{4}$ (B) $\frac{\lambda}{8}$ (C) $\frac{\lambda}{2}$ (D) $\frac{\lambda}{3}$

15. **C**

16. A mirror (μ = 3/2) is 10 cm thick. An object is placed 15 cm in front of it (from refracting surface) . The position of image from the front surface is
(A) 15 cm (B) 21.67 cm
(C) 28.34 cm (D) 35 cm

16. **B**

17. $\frac{1}{v}$ vs $\frac{1}{u}$ graph for a spherical mirror is shown in the figure. The focal length of the mirror will be



(A) 5 cm (B) –5 cm
(C) $\frac{6}{5}$ cm (D) $-\frac{6}{5}$ cm

17. **C**

18. The slits in a young's double slit experiment have equal width and the source is placed symmetrically with respect to the slits. The intensity of the central fringe is I_0. If one of the slits is closed ,the intensity of this point will be :
(A) $4I_0$ (B) $I_0 / 4$
(C) $I_0 / 2$ (D) None of these

18. **B**

19. The maximum number of possible interference maxima for slit separation equal to twice the wavelength in Young's double slit experiment is (consider the screen of finite size)
(A) infinite (B) five (C) three (D) zero

19. **C**

20. Critical angle of light passing from glass to air is maximum for
(A) red colour. (B) green colour (C) yellow colour. (D) violet colour.

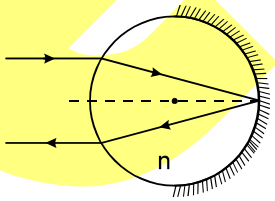
20. **A**

(PART – B)

(Integer Type)

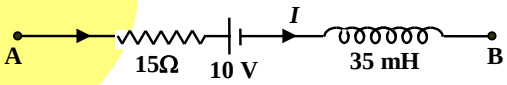
Part-C (01-05) contains five (05) Numerical based questions, the answer of which maybe positive or negative numbers or decimals (e.g. 6.25, 7.00, -0.33, -.30, 30.27, -127.30) and each question carries **+4 marks** for correct answer and **there will be no negative marking.**

21. A transparent cylinder has its right half polished so as to act as a mirror. A paraxial light ray is incident from left that is parallel to principal axis, exits parallel to the incident ray as shown. Find the refractive index n of the material of the cylinder.



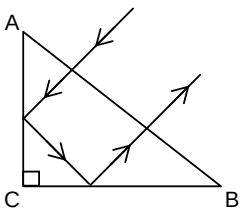
21. **2.00**

22. The network shown in Figure is part of a complete circuit. If at a certain instant the current (I) is 5A, and is decreasing at a rate of 10^3 A/s, then $V_B - V_A$ =



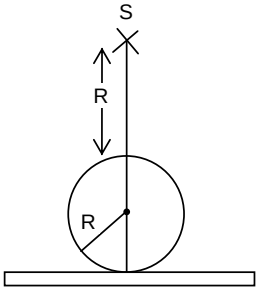
22. **–50.00**

23. A ray of light is incident normally on face AB of an isosceles right angled prism as shown in figure. The least value of refractive index of the prism must be just greater than k, then 'k' is ____



23. **1.41**
Range: 1.40 to 1.42

24. An opaque sphere of radius R = 1m 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" S.I Units, then 'k' is _____.



24. **9.42**
Range: 9.30 to 9.45

25. Fringes are produced using light of wavelength λ = 4800 A^0 in a double-slit experiment. One of the slits is covered by a thin plate of glass of refractive index 1.4 and other slit by another plate of glass of double the thickness and of refractive index 1.7.
During this process, the central bright fringe shifts to a position originally occupied by the fifth bright fringe from the centre. If the thickness of thin glass plate is n x 10^{-7} m, then n =

25. **24**

SECTION – II : CHEMISTRY

(PART – A)

Single Correct Questions

This section contains 20 Single Correct Questions out of which only one option is correct

1. Equimolar quantities of which of the following can decrease the vapour pressure of water by maximum extent?
[Assume complete dissociation of salts]
(A) NaCl (B) $CaCl_2$
(C) $AlCl_3$ (D) CCl_4

1. **C**

2. The incorrect statement regarding ozone(O_3) is
(A) it is a paramagnetic compound
(B) it behaves as a bleaching agent
(C) it is a stronger oxidizing agent than O_2
(D) its decomposition reaction is exothermic in nature

2. **A**

3. The incorrect statement regarding the behaviour of XeF_6 is:
(A) it's molecular structure is distorted octahedral
(B) it contains one lone pair
(C) it's dipole moment is zero
(D) Xe undergoes sp^3d^3 hybridization in it

3. C

4. Which metallurgical process is not required in order to extract aluminium from bauxite?
(A) Calcination (B) Roasting
(C) Electrolytic reduction (D) Leaching

4. B

5. Which of the following is used as an antacid?
(A) NaOH (B) $Ca(OH)_2$
(C) $Al(OH)_3$ (D) KOH

5. C

6. In the crystal of NaCl, Na^+ ions are present at
(A) face centres and edge centres (B) corners and body centre
(C) edge centres and body centre (D) face centres and corners

6. C

7. Entropy will increase if $[M(H_2O)_6]^{2+}$ reacts with
(A) CH_3NH_2 (B) $H_2N - CH_2 - CH_2 - NH_2$
(C) CN^- (D) NH_2OH

7. B

8. Which of the following statement is not correct for zinc?
(A) It's oxide changes colour on heating
(B) It melts at the lowest temperature among the 3d-transition metals
(C) It's carbonate is called calamine
(D) It forms colour compounds with sulphur at room temperature

8. D

9. Reaction of carbonate ions with dilute HCl produces
(A) $CO + H_2O$ (B) $CO_2 + H_2O$
(C) $CH_4 + CO_2$ (D) $Cl_2 + CO_2$

9. B

10. 100 mL of 0.2 M $CaCl_2$ solution is isotonic with
(A) 100 mL of 0.2 M $C_6H_{12}O_6$ solution (B) 200 mL of 0.3 M NaCl solution
(C) 100 mL of 0.3 M KCl solution (D) 200 mL of 0.1 M $Al_2(SO_4)_3$ solution

10. C

11. Ozone does not produce O_2 gas when reacts with
(A) SO_2 (B) KI
(C) HCl (D) $FeSO_4$

11. A

12. Which can easily form nascent oxygen atom on heating?
(A) HClO (B) $HClO_2$
(C) $HClO_3$ (D) $HClO_4$

12. A

13. The correct hydrolysis order of the following compounds is
(A) $XeF_2 > XeF_4 > XeF_6$ (B) $XeF_4 > XeF_6 > XeF_2$
(C) $XeF_6 > XeF_4 > XeF_2$ (D) $XeF_2 = XeF_4 = XeF_6$

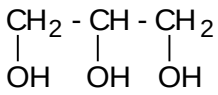
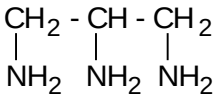
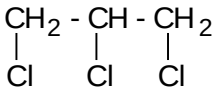
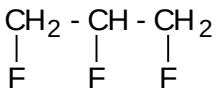
13. C

14. A metal forms complexes in negative oxidation state. The suitable ligand for this complex is
(A) NH_3 (B) CO
(C) CN^- (D) NH_2^-

14. B

15. A metal crystal contains b.c.c unit cell with edge length equal to 'a' which characteristic of the crystal is expressed by the term $\frac{\sqrt{3}a}{2}$?
(A) distance between octahedral and tetrahedral voids
(B) radius of the atom
(C) diameter of the atom
(D) distance between face centre and corner

15. C

16. I.  II.  III.  IV. 

Which of the above solute can decrease the freezing point of water by maximum extent?

(A) I (B) II

(C) III (D) IV

16. B

17. The vapour pressure of a solution of two liquids A and B is expressed as V.P = (100 + 120 X_B) mm of Hg. Choose correct statement.

(A) The boiling point of pure liquid A is greater than that of B

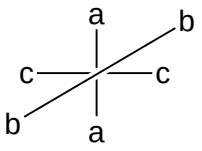
(B) Liquid A is more volatile than B

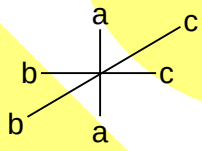
(C) Ratio of vapour pressures of the two liquids A:B = 1:3

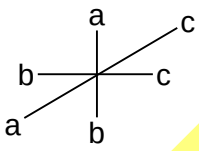
(D) The vapour pressure of a solution formed by mixing equal moles of A and B is 110 mm of Hg

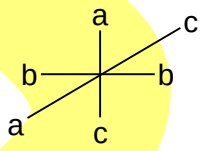
17. A

18. Which is a chiral octahedral complex?

(A) 

(B) 

(C) 

(D) 

18. C

19. For an electrolyte XY_2

$\lambda_m^0 X^{2+} = 40 \text{ ohm}^{-1}\text{cm}^2\text{mol}^{-1}$

$\lambda_m^0 Y^{-} = 20 \text{ ohm}^{-1}\text{cm}^2\text{mol}^{-1}$

What will be the molar conductance of the electrolyte solution if XY_2 undergoes 40% dissociation?

(A) 48 $\text{ohm}^{-1}\text{cm}^2\text{mol}^{-1}$ (B) 32 $\text{ohm}^{-1}\text{cm}^2\text{mol}^{-1}$

(C) 60 $\text{ohm}^{-1}\text{cm}^2\text{mol}^{-1}$ (D) 80 $\text{ohm}^{-1}\text{cm}^2\text{mol}^{-1}$

19. B

20. Which reaction in contact process needs a catalyst?

(A) $S + O_2 \longrightarrow SO_2$ (B) $2SO_2 + O_2 \longrightarrow 2SO_3$

(C) $SO_3 + H_2SO_4 \longrightarrow H_2S_2O_7$ (D) $H_2S_2O_7 + H_2O \longrightarrow 2H_2SO_4$

20. B

(PART – B)

(Integer Type)

Part-C (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 **+4 marks** for correct answer and **there will be no negative marking.**

1. $Cr_2(SO_4)_3 + NaOH + H_2O_2 \longrightarrow$ Yellow solution

   If the oxidation number of chromium in the anion that provides yellow colour is +x, the value of x will be

1. 6

2. If the ions along all the body diagonals of the unit cell of NaCl are removed. How many effective number of Cl^- ions will be present per unit cell?

2. **3**

3. $FeSO_4 \xrightarrow{Heat} (P) + SO_2 + SO_3$

   How many atom(s) is/are present in one molecule of (P)?

3. 5

4. $Zn \mid Zn^{2+}(1\ M) \parallel H^+ sol^n \mid H_2(1\ atm), Pt$

   The standard reduction potential of Zn^{2+}/Zn = -0.76 V. If the value of E_{Cell} of the above electrochemical cell is 0.6418 V, the pH of the H^+ solution of hydrogen electrode will be:

4. **2**

5. If the fraction of tetrahedral voids occupied by Zn^{2+} ions in ZnS unit cell is x : y, then what is the value of $\left(\frac{x+y}{y}\right)$?

5. 1.5

SECTION – I : MATHEMATICS

(PART – A)

Single Correct Questions

This section contains 20 Single Correct Questions out of which only one option is correct

1. Consider the system of equations $\begin{bmatrix}1 & 1 & 2\\ 2 & -1 & 3\\ 5 & -1 & a\end{bmatrix}\begin{bmatrix}x\\ y\\ z\end{bmatrix}=\begin{bmatrix}2\\ 2\\ 6\end{bmatrix}$ in x, y, z ($a \in R$). Correct option is

(A) If a = 8, system has no solution
(B) If $a \neq 8$, system has no solution.
(C) If a = 8, system has infinitely many solutions
(D) System doesn't have solution for all values of a

1. C

2. Let $\vec{a},\vec{b},\vec{c}$ are three non-zero vectors such that $|\vec{a}|=1,|\vec{b}|=2,\vec{a}\cdot\vec{b}=0,\vec{c}\cdot\vec{a}=0,\vec{c}\cdot\vec{b}=1$ and $\left[\vec{c}\ \vec{a}\ \vec{b}\right]=1$. Further $\vec{a}$ and $\vec{b}$ are non collinear. Then length of $\vec{c}$ is

(A) $\sqrt{2}$ (B) 1
(C) $\frac{1}{\sqrt{2}}$ (D) None of these

2. C

3. The area bounded by $|y|=\sqrt{x}$ and $x=|y|+2$ is equal to

(A) $\frac{22}{3}$ (B) $\frac{20}{3}$
(C) $\frac{16}{3}$ (D) $\frac{14}{3}$

3 B

4. The length of the longer diagonal of the parallelogram constructed on $5\vec{a}+2\vec{b}$ and $\vec{a}-3\vec{b}$, if it is given that $|\vec{a}|=2\sqrt{2},|\vec{b}|=3$ and angle between $\vec{a}$ and $\vec{b}$ is $\pi/4$, is

(A) $\sqrt{473}$ (B) $\sqrt{593}$
(C) $\sqrt{474}$ (D) $\sqrt{594}$

4 B

5. If a, b, c are in G.P. or $(x-\alpha)$ is a factor of $ax^2+2bx+c$ then value of the determinant $\begin{vmatrix} a & b & a\alpha+b\\ b & c & b\alpha+c\\ a\alpha+b & b\alpha+c & 0\end{vmatrix}$ is equal to

(A) 1 (B) – 1
(C) 2 (D) 0

5 D

6. Let $\bar{a} = \hat{i} + \hat{j} + \hat{k}$, $\bar{c}$ is a vector such that $\bar{a}.\bar{c} = |\bar{c}|$, $|\bar{a} + \bar{c}| = \sqrt{6}$, then $\bar{a}.\bar{c}$ is equal to
(A) 1 (B) 5
(C) 3 (D) none of these

6 A

7. For a square matrix A, if $5A^3 - 2A^2 + 3A + I = 0$, ($|A| \neq 0$) then A^{-1} is equal to
(A) $5A^2 - 2A + 3I$ (B) $5A^2 - 2A - 3I$
(C) $-5A^2 + 2A - 3I$ (D) $-5A^2 - 2A - 3I$

7 C

8. The area bounded by $y = \max\{|x-2|+2,\ 3-|x-2|\}$ and $y = \min\{|x-2|+2,\ 3-|x-2|\}$ is
(A) 1 (B) $\frac{1}{2}$
(C) $\frac{3}{2}$ (D) 2

8 B

9 If ω is a cube root of unity, then
$$\begin{vmatrix} 1+i & 1+\omega^2-\omega & i+\omega-\omega^2 \\ i & i+\omega^2 & -\omega^2 \\ \omega-1 & 2\omega-i-1 & i-\omega \end{vmatrix}$$ equals
(A) 1 (B) 0
(C) i (D) ω

9 B

10. The area enclosed between the curves $y = \sin^2 x$ and $y = \cos^2 x$ in the interval $0 \le x \le \pi$ is
(A) 2 (B) 1/2
(C) 1 (D) None of these

10 B

11. If A and B are symmetric matrices of the same order and X = AB + BA and Y = AB − BA, then $(XY)^T$ is equal to
(A) XY (B) YX
(C) − YX (D) none of these

11 **C**

12. If $\vec{a}, \vec{b}, \vec{c}$ are unit vectors, such that $\vec{a} + \vec{b} + \vec{c} = 0$, then the value of $\vec{a}.\vec{b} + \vec{b}.\vec{c} + \vec{c}.\vec{a}$ is
(A) 1 (B) -1
(C) -3/2 (D) None of these

12 C

13. If α, β, γ are the roots of the equation $x^3 + x^2 + x + 1 = 0$ then $\begin{vmatrix} 1+\alpha^2 & 1 & 1 \\ 1 & 1+\beta^2 & 1 \\ 1 & 1 & 1+\gamma^2 \end{vmatrix}$ is equal to

(A) 1 (B) 0
(C) 2 (D) none of these

13 B

14. If $\int_0^a (3-2x)\,dx < a-3$, then

(A) $-1 < a < 3$ (B) $a < -1$ or $a > 3$ (C) $a < -1$ (D) $a > 3$

14 A

15. If $\int_0^{t^2} xf(x)\,dx = \frac{2}{5}t^5,\ t > 0$, then $f\left(\frac{4}{25}\right) =$

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

15 D

16. $\int_0^{\frac{\pi}{2}} |\cos x - \sin x|\,dx =$

(A) $2\left(\sqrt{2}-1\right)$ (B) $2\left(\sqrt{2}+1\right)$ (C) $2\sqrt{2}$ (D) 0

16 D

17. The value of $\int_0^{[x]} \frac{5^x}{5^{[x]}}\,dx$ (where [.] represents the greatest integer function)

(A) [x] log 5 (B) $\frac{[x]}{\log 5}$

(C) $\frac{1}{2}\frac{[x]}{\log 5}$ (D) none of these

17. **B**

18. What is the differential equation of the parabolas having their foci at the origin and axes along the X–axis.

(A) $y\left(\frac{dy}{dx}\right)^2 + 2x\frac{dy}{dx} = y$ (B) $y\left(\frac{dy}{dx}\right)^3 + 4x\frac{dy}{dx} = y$ (C) $y\left(\frac{dy}{dx}\right)^2 + 5x\frac{dy}{dx} = y$ (D) none of these

18 A

19. What is the differential equation of the ellipses with centers at the origin and having coordinate axes as axes.

(A) $xy\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)^3-2y\frac{dy}{dx}=0$ (B) $xy\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)^3-5y\frac{dy}{dx}=0$

(C) $xy\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)^2-y\frac{dy}{dx}=0$ (D) none of these

19 C

20. The area bounded by the curve $|x|=\cos^{-1}y$ and the line |x| = 1 and the x-axis is

(A) cos 1 (B) sin 1

(C) 2 cos 1 (D) 2 sin 1

20 D

(PART – B)

(Integer Type)

Part-C (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 **+4 marks** for correct answer and **there will be no negative marking.**

1. The area bounded by y = |x-1| and y = 3 -|x| is P then P/16 is

1. 0.25

2. If $f(x)=\begin{vmatrix}1 & x & x+1\\ 2x & x(x-1) & (x+1)x\\ 3x(x-1) & x(x-1)(x-2) & (x+1)x(x-1)\end{vmatrix}$, then $\frac{f(100)+10}{9}$ is equal to

2. 11

3. The degree of the differential equation of all tangents lines to the parabola $x^2 = 4y$ is

3. 2

4. If $\vec{A}, \vec{B}, \vec{C}$ are non-coplanar vectors then $\frac{\vec{A}.\vec{B}\times\vec{C}}{\vec{C}\times\vec{A}.\vec{B}}+\frac{\vec{B}.\vec{A}\times\vec{C}}{\vec{C}.\vec{A}\times\vec{B}}$ is equal to R then $\frac{R-1}{2}$ is

4. – 0.5

5. The area of the region lying between the line $x-y+2=0$ and curve $x=\sqrt{y}$ is (in sq. units)

5. 3.33