

# FIITJEE - JEE (Main)

PHYSICS, CHEMISTRY & MATHEMATICS

BATCHES: NWCM2022EW

PHASE TEST – IV

Q.P. CODE:

Time Allotted: 3 Hours

Maximum Marks: 300

- Do not open this Test Booklet until you are asked to do so.
- Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

## 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 & C** in the OMR. Part-B of OMR to be left unused
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 : \_\_\_\_\_

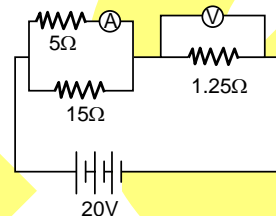
# Physics

## PART – A

### Straight Objective Type

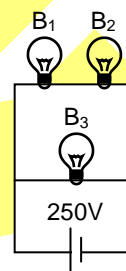
This part contains **20 multiple choice questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

1. An ideal ammeter (zero resistance) and an ideal voltmeter (infinite resistance) are connected as shown. The ammeter and voltmeter readings are  
 (A) 6.25 A, 3.75 V  
 (B) 3.00 A, 5 V  
 (C) 3.00 A, 3.75 V  
 (D) 6.00 A, 6.25 V



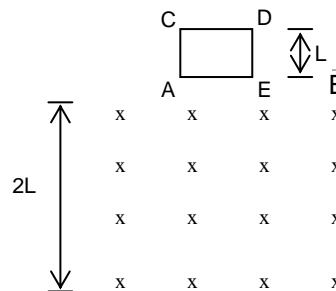
1. **B**

2. A 100 W bulb  $B_1$ , and two 60 W bulbs  $B_2$  and  $B_3$ , are connected to a 250 V source, as shown in the figure. Now  $W_1$ ,  $W_2$  and  $W_3$  are the output powers of the bulbs  $B_1$ ,  $B_2$  and  $B_3$  respectively. Then  
 (A)  $W_1 > W_2 = W_3$   
 (B)  $W_1 > W_2 > W_3$   
 (C)  $W_1 < W_2 = W_3$   
 (D)  $W_1 < W_2 < W_3$



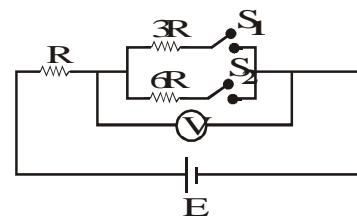
2. **D**

3. A square coil ACDE with its plane vertical is released from rest in a horizontal uniform magnetic field  $\vec{B}$  of length  $2L$ . The acceleration of the coil is  
 (A) less than  $g$  for all the time till the loop crosses the magnetic field completely  
 (B) less than  $g$  when it enters the field and greater than  $g$  when it comes out of the field  
 (C)  $g$  all the time  
 (D) less than  $g$  when it enters and comes out of the field but equal to  $g$  when it is within the field



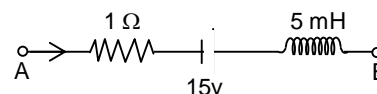
3. **D**

4. In the circuit shown in the figure, reading of voltmeter is  $V_1$  when only  $S_1$  is closed, reading of voltmeter is  $V_2$  when only  $S_2$  is closed and reading of voltmeter is  $V_3$  when both  $S_1$  and  $S_2$  are closed. Then  
 (A)  $V_3 > V_2 > V_1$   
 (B)  $V_2 > V_1 > V_3$   
 (C)  $V_3 > V_1 > V_2$   
 (D)  $V_1 > V_2 > V_3$



4. **B**

5. In the given part of a network, the value of  $v_B - v_A$ , when current  $I$  is 5 ampere and decreasing at rate of 1000 A/s is



- (A)  $-15$  V  
 (B)  $15$  V  
 (C)  $15$  mV  
 (D) none of above

5. **B**

6. A proton (charge  $e$ , mass =  $m$ ) moves in a circle of radius of  $r_p$  when moved perpendicular to the magnetic field  $B$ , with kinetic energy  $K$ . Find out the radius of a proton moving with kinetic energy  $4K$ .

- (A)  $r_p$  (B)  $2r_p$   
 (C)  $3r_p$  (D)  $4r_p$

6. **B**

7. The potential of point A is 16V higher than potential of point B. Both the batteries have internal resistance  $1\Omega$  as shown in the circuit. Which of the following is incorrect?



- (A) The current through the  $2\Omega$  resistance is 3.5 amp.  
 (B) The current through the  $4\Omega$  resistance is 2.5 amp.  
 (C) The current through the  $3\Omega$  resistance is 1.5 amp.  
 (D) The potential difference between the terminals of the 9 V battery is 7 V.

7. **B**

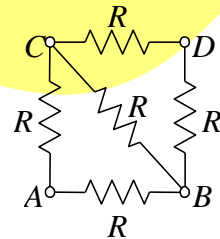
8. Resistance of a conductor does not depend on

- (A) area of cross-section of the conductor (B) length of the conductor  
 (C) temperature (D) voltage applied

8. **D**

9. The resistance across AB is

- (A)  $\frac{5}{8} R$  (B)  $\frac{7}{8} R$   
 (C)  $1 R$  (D)  $2 R$



9. **A**

10. Magnetic flux through a circuit of resistance  $R$  changes by an amount  $\Delta\phi$  in a time  $\Delta t$ . Total quantity of electric charge  $Q$  that passes any point in the circuit during the time  $\Delta t$  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. What is the self-inductance of a coil which produces 5 V when the current changes from 3A to 2A in one millisecond?

- (A) 5000 H (B) 5 mH  
 (C) 50 H (D) 5 H

11. **B**

12. Which of the following involves electromagnetic induction?

- (A) A rod is charged with electricity  
 (B) An electric current produces a magnetic field  
 (C) A magnetic field exerts a force on a current carrying wire  
 (D) The relative motion between a magnet and a coil produces an electric current

12. **D**

13. You have a coil and a bar magnet. You can produce an electric current by moving

- (A) the magnet, but not the coil (B) the coil, but not the magnet  
 (C) either the magnet or the coil (D) neither the magnet nor the coil

13. **C**

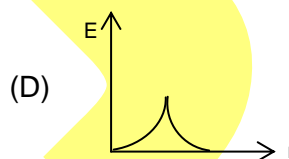
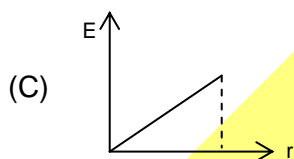
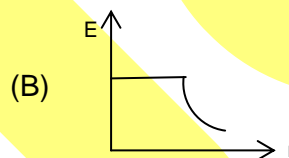
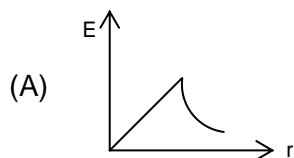
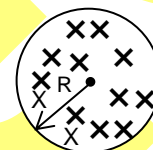
14. A cell of emf  $E$  and internal resistance ' $r$ ' is connected in series with an external resistance  $5r$ . Then the ratio of the terminal potential difference to emf is  
 (A)  $\frac{1}{5}$  (B)  $\frac{1}{6}$  (C)  $\frac{5}{6}$  (D)  $\frac{6}{5}$

14. **C**

15. A current flows along the length of a long thin cylindrical shell, then which of the following statements is incorrect?  
 (A) Magnetic field at all the points lying inside the shell is zero.  
 (B) Magnetic field at any point outside the shell varies inversely with distance from the surface of the shell.  
 (C) Magnetic field strength is maximum just outside the shell.  
 (D) Magnetic field strength is minimum just outside the shell.

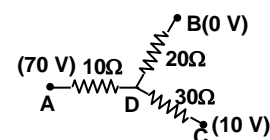
15. **D**

16. A cylindrical space of radius  $R$  is filled with a uniform magnetic induction  $B$  parallel to the axis of the cylinder. If  $B$  changes at a constant rate, the graph showing the variation of induced electric field with distance  $r$  from the axis of cylinder is



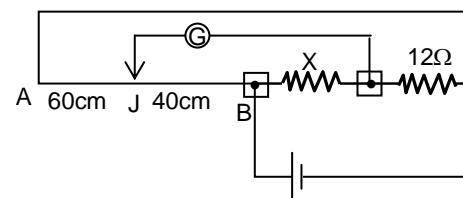
16. **A**

17. In the network shown, points A, B and C are at potentials of 70 V, zero and 10 V respectively.  
 (A) Point D is at a potential of 20 V.  
 (B) The currents in the sections AD, DB, DC are in the ratio 3 : 2 : 1.  
 (C) The currents in the sections AD, DB, DC are in the ratio 1 : 2 : 3.  
 (D) The network draws a total power of 400 W.



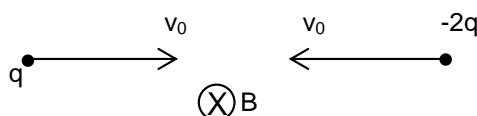
17. **B**

18. If reading of galvanometer is 0 then value of unknown resistance  $x$  is  
 (A)  $8 \Omega$  (B)  $18 \Omega$   
 (C) data insufficient (D)  $12 \Omega$



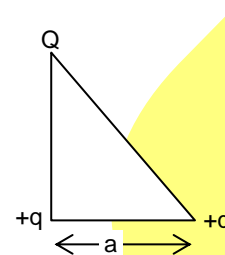
18. **A**

19. A charge particle  $q$  of mass  $m$  is placed at a distance  $d$  from another charge particle  $-2q$  of mass  $2m$  in a uniform magnetic field  $B$  as shown. If particles are projected towards each other with equal speed  $v_0$ , so that the two particles do not collide, then maximum value of  $v_0 =$  (Assume only magnetic interaction)



- (A)  $\frac{qBd}{m}$  (B)  $\frac{qBd}{2m}$

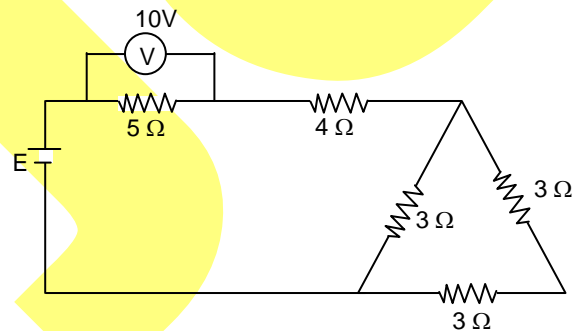
- (C)  $\frac{2qBd}{m}$  (D)  $\frac{3qBd}{2m}$
19. **B**
20. Three charges  $Q$ ,  $+q$  and  $+q$  are placed at the vertices of a right angle triangle (isosceles triangle) as shown. The net electrostatic energy of the configuration is zero, if  $Q$  is equal to
- (A)  $\frac{-q}{1+\sqrt{2}}$  (B)  $\frac{-2q}{2+\sqrt{2}}$
- (C)  $-2q$  (D)  $+q$
20. **B**



**PART-B**  
**Numerical Type**

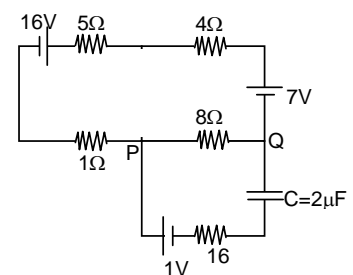
21. Two copper wires, one double the diameter of the other, have the same current through them. If the electrons in the thinner wire have drift speed  $v_1$  and the electrons in the thicker wire have a drift speed  $v_2$ , what is the value of  $v_2/v_1$ .
21. **0.25**

22. Find the value of  $\frac{E}{10}$



22. **2.20**

23. The charge (in  $\mu\text{F}$ ) appearing on the capacitor in the circuit under steady state condition is



23. **6**

24. A wire 1m long has a resistance of  $1\Omega$ . If it is uniformly stretched, so that its length increases by 25%, then its resistance will increase by (in percentage).
24. **56.25**

25. A steady current  $I$  goes through a wire loop PQR having shape of a right angle triangle with  $PQ = 3x$ ,  $PR = 4x$  and  $QR = 5x$ . If the magnitude of the magnetic field at P due to this loop is  $k\left(\frac{\mu_0 I}{48\pi x}\right)$ , find the value of  $k$ .
25. **7**

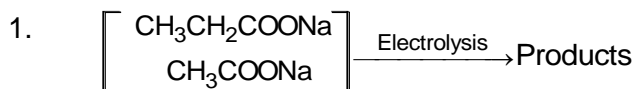
Space For Rough Work

# Chemistry

## PART – A

### Straight Objective Type

This part contains **20 multiple choice questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

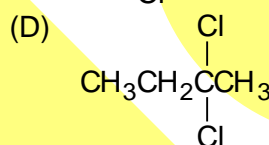
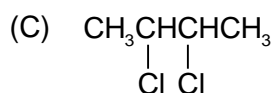
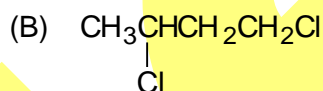
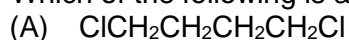


Which of the following is not a product of above reaction?

- (A)  $\text{C}_2\text{H}_6$  (B)  $\text{C}_4\text{H}_{10}$   
(C)  $\text{C}_3\text{H}_8$  (D)  $\text{C}_4\text{H}_8$

1. **D**

2. Which of the following is a vicinal halide?



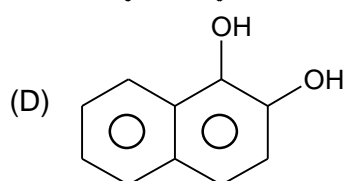
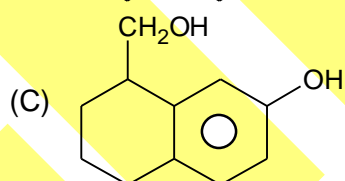
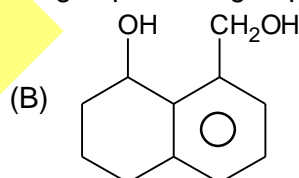
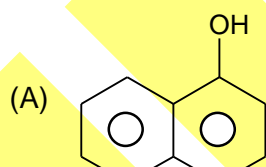
2. **C**

3. Which of the following can dehydrogenate  $\text{CH}_3\text{OH}$ ?

- (A) Na and NaOH (B) NaOH and  $\text{SOCl}_2$   
(C) Na and  $\text{Cu}/300^\circ\text{C}$  (D) NaOH and  $\text{Cu}/300^\circ\text{C}$

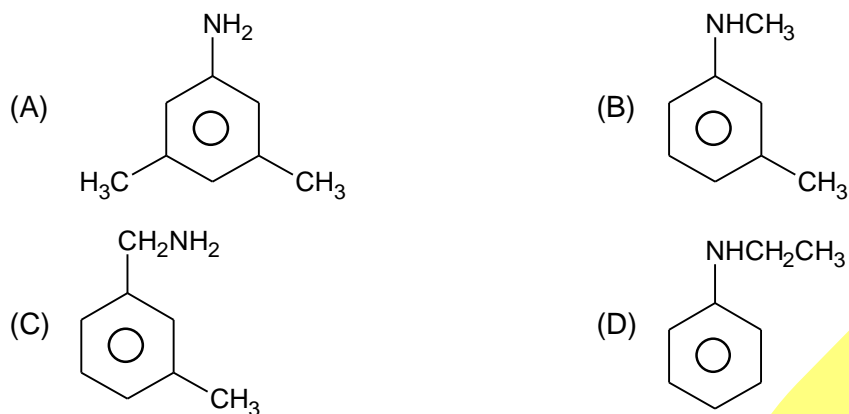
3. **C**

4. Which of the following compound does not belong to phenolic group?



4. **B**

5. The most basic compound out of the following is:



5. C

6. Which isomer of  $\text{CH}_2 = \text{CH} - \text{CH} = \text{CH} - \text{CH}_3$  forms white precipitate with ammonical  $\text{AgNO}_3$  solution?

- (A) Chain isomer  
(B) Position isomer  
(C) Functional isomer  
(D) Geometrical isomer

6. C

7. Which of the following compound is most reactive towards  $\text{KCN}$  through  $\text{S}_{\text{N}}2$  path?

- (A)  $\text{CH}_3\text{F}$   
(B)  $\text{CH}_3\text{Cl}$   
(C)  $\text{CH}_3\text{Br}$   
(D)  $\text{CH}_3\text{I}$

7. D



The product of above reaction is a/an

- (A)  $1^\circ$ -alcohol  
(B)  $2^\circ$ -alcohol  
(C) aldehyde  
(D) enol

8. A

9. Formaldehyde ( $\text{HCHO}$ ) forms two different organic products when reacts with

- (A)  $\text{LiAlH}_4$   
(B) conc.  $\text{NaOH}$   
(C)  $\text{NH}_3$   
(D)  $\text{HCN}$

9. B

10.  $\text{CH}_3\text{COCH}_3$  can form a tertiary alcohol when reacts with

- (A)  $\text{CH}_3\text{Cl}$   
(B)  $\text{CH}_3\text{MgBr}/\text{H}_3\text{O}^+$   
(C)  $\text{Cu}/300^\circ\text{C}$   
(D) (i)  $\text{PCl}_5$ /(ii)  $\text{H}_2\text{O}$

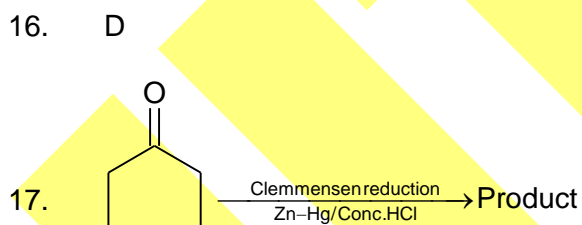
10. B

11. Which will convert  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$  to a chiral compound?

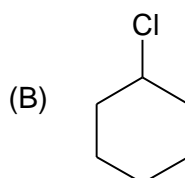
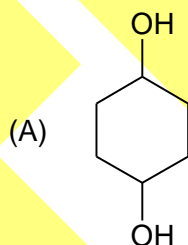
- (A)  $\text{CH}_3\text{CH}_2\text{NH}_2$   
(B)  $\text{LiAlH}_4/\text{HCl}$   
(C)  $\text{Cl}_2/\text{red P}$   
(D)  $\text{CH}_3\text{CH}_2\text{OH}/\text{Conc. H}_2\text{SO}_4$

11. C

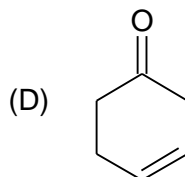
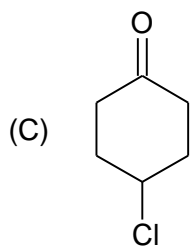
12. Which reaction of glucose confirms the presence of a straight chain of six carbon atoms in it?  
 (A)  $\text{LiAlH}_4$  (B)  $\text{CH}_3\text{COCl/Py}$   
 (C) Conc.  $\text{HI/red P}$  (D)  $\text{Br}_2/\text{H}_2\text{O}$
12. C
13. Which of the following compounds does not give nitrogen detection test?  
 (A)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CN}$  (B)  $\text{CH}_3\text{NHCH}_3$   
 (C)  $\text{NH}_2\text{NH}_2$  (D)  $\text{CH}_3\text{CHNHCH}_3$
13. C
14. The concentration of which of the following species of glycine is maximum at  $\text{pH} = 4$ ?  
 $[\text{p}^i = 6.4]$   
 (A)  $\text{NH}_2 - \text{CH}_2 - \text{COOH}$  (B)  $\text{NH}_2 - \text{CH}_2 - \text{COO}^-$   
 (C)  $\text{NH}_3^+ - \text{CH}_2 - \text{COO}^-$  (D)  $\text{NH}_3^+ - \text{CH}_2 - \text{COOH}$
14. D
15. With which of the following reagent benzene forms the lightest product?  
 (A)  $\text{Br}_2/\text{CS}_2$  (B)  $\text{Zn dust}/\Delta$   
 (C)  $\text{CHCl}_3/\text{KOH}$  (D)  $\text{CH}_2\text{N}_2$
15. B
16. Which of the following cannot form a yellow precipitate with  $\text{I}_2/\text{NaOH}$ ?  
 (A)  $\text{CH}_3\text{COCH}_3$  (B)  $\text{CH}_3\text{CHO}$   
 (C)  $\text{CH}_3\text{CH}_2\text{OH}$  (D)  $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{CH}_3$



The product of above reaction is:

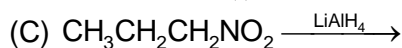
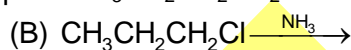
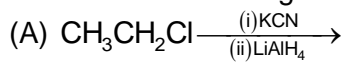






17. B

18. Which of the following reaction cannot form pure  $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ ?



18. B

19. Proteins those respond to Xanthoprotic test should contain a/an

(A) primary alkyl group

(B) phenyl group

(C) secondary alkyl group

(D) phosphorus

19. B

20. How many carbon atom(s) is/are present in the repeating unit of Nylon 6, 6?

(A) 8

(B) 10

(C) 12

(D) 6

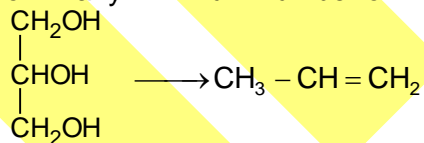
20. C

### PART-B Numerical Type

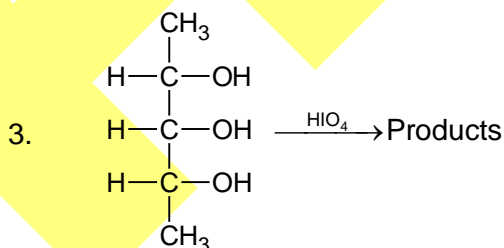
1. How many structural isomer(s) containing four membered ring(s) is/are possible with formula  $\text{C}_4\text{H}_5\text{F}$ ?

1. 4

2. How many minimum number of moles of HI is needed for the following change?

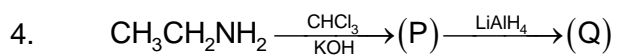


2. 4



How many moles of carboxylic acid(s) is/are formed in the above reaction?

3. 1



How many hydrogen atom(s) is/are present in the organic product(Q)?

4. 9

5. How much gram of aldehyde is obtained, when 7.85 g of acetyl chloride undergoes Rosenmund reduction with Pd/BaSO<sub>4</sub>?

5. 4.4

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*Space For Rough Work*

# Mathematics

## PART – A

### Straight Objective Type

This part contains **20 multiple choice questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

1. The area bounded by the parabola  $y^2 = x$ , straight line  $y = 4$  and y-axis is  
 (A)  $\frac{64}{3}$  (B)  $\frac{16}{3}$   
 (C)  $7\sqrt{2}$  (D) none of these
1. A
2. The area of region bounded by  $y = |x - 1|$  and  $y = 1$  is  
 (A) 1 (B) 2  
 (C)  $1/2$  (D) none
2. A
3. The adjoint of the matrix  $A = \begin{bmatrix} 1 & 2 \\ 3 & -5 \end{bmatrix}$  is  
 (A)  $\begin{bmatrix} -5 & -2 \\ -3 & 1 \end{bmatrix}$  (B)  $\begin{bmatrix} -5 & -3 \\ -2 & 1 \end{bmatrix}$   
 (C)  $\begin{bmatrix} 1 & -2 \\ -3 & 5 \end{bmatrix}$  (D) none of these
3. A
4.  $\begin{bmatrix} 7 & 1 & 2 \\ 9 & 2 & 1 \end{bmatrix} \begin{bmatrix} 3 \\ 4 \\ 5 \end{bmatrix} + 2 \begin{bmatrix} 4 \\ 2 \end{bmatrix} =$   
 (A)  $\begin{bmatrix} 43 \\ 44 \end{bmatrix}$  (B)  $\begin{bmatrix} 43 \\ 45 \end{bmatrix}$   
 (C)  $\begin{bmatrix} 45 \\ 44 \end{bmatrix}$  (D) none of these
4. A
5. The matrix X in the equation  $AX = B$ , such that  $A = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$  is given by  
 (A)  $\begin{bmatrix} 1 & 0 \\ -3 & 1 \end{bmatrix}$  (B)  $\begin{bmatrix} 1 & -4 \\ 0 & 1 \end{bmatrix}$   
 (C)  $\begin{bmatrix} 1 & -3 \\ 0 & 1 \end{bmatrix}$  (D)  $\begin{bmatrix} 0 & -1 \\ -3 & 1 \end{bmatrix}$
5. B

6. If  $\begin{vmatrix} y+z & x & x \\ y & z+x & y \\ z & z & x+y \end{vmatrix} = k(xyz)$ , then  $k$  is equal to  
 (A)  $-2$  (B)  $4$   
 (C)  $2$  (D)  $-4$
6. B
7. If the matrix  $\begin{bmatrix} 1 & 3 & \lambda+2 \\ 2 & 4 & 8 \\ 3 & 5 & 10 \end{bmatrix}$  is singular, then  $\lambda$  is equal to  
 (A)  $-2$  (B)  $4$   
 (C)  $2$  (D)  $-4$
7. B
8.  $y = a \sin x + b \cos x$  is the solution of differential equation  
 (A)  $\frac{d^2y}{dx^2} + y = 0$  (B)  $\frac{dy}{dx} + y = 0$   
 (C)  $\frac{d^2y}{dx^2} = y$  (D)  $\frac{dy}{dx} = y$
8. A
9. The general solution of  $\frac{dy}{dx} = 1+y^2$  is  
 (A)  $1-y^2 = cx$  (B)  $1+y^2 = cx$   
 (C)  $1-x^2 = cy$  (D)  $y = \tan(x+c)$
9. D
10. The angle between the planes  $2x - y + z = 11$  and  $x + y + 2z = 3$  is given by  
 (A)  $\frac{2\pi}{3}$  (B)  $-\frac{2\pi}{3}$   
 (C)  $\frac{\pi}{3}$  (D)  $-\frac{\pi}{3}$
10. C
11. The ratio in which  $yz$ -plane divides the line joining  $(2, 4, 5)$  and  $(3, 5, 7)$   
 (A)  $-2 : 3$  (B)  $2 : 3$   
 (C)  $3 : 2$  (D)  $-3 : 2$
11. A
12. If the vectors  $2i - 3j + 4k$ ,  $i + 2j - k$  and  $xi - j + 2k$  are coplanar, then  $x =$   
 (A)  $\frac{8}{5}$  (B)  $\frac{5}{8}$   
 (C)  $0$  (D)  $1$
12. A
13. The number of vectors of unit length perpendicular to vector  $a \equiv (1, 1, 0)$  and  $b \equiv (0, 1, 1)$  is  
 (A)  $1$  (B)  $2$   
 (C)  $3$  (D)  $4$

13. B
14. If  $\vec{A} = 3\hat{i} + \hat{j} + 2\hat{k}$  and  $\vec{B} = 2\hat{i} - 2\hat{j} + 4\hat{k}$  and  $\theta$  is the angle between  $\vec{A}$  and  $\vec{B}$ , then the value of  $\sin\theta$  is  
 (A)  $\frac{2}{\sqrt{7}}$  (B)  $\sqrt{\frac{2}{7}}$   
 (C)  $\frac{4}{\sqrt{7}}$  (D)  $\frac{3}{\sqrt{7}}$
14. A
15. The equation of the line passing through (1, 2, 3) and (0, 0, 0) is  
 (A)  $x = \frac{y}{2} = \frac{z}{3}$  (B)  $x - 1 = y - 2 = z - 3$   
 (C)  $x = y = z$  (D)  $x = -y = z$
15. A
16. The unit vector parallel to the sum of two vectors  $i + j - 4k$  &  $i - 4j - 2k$  is  
 (A)  $\frac{1}{7}(2i - 3j - 6k)$  (B)  $\frac{1}{7}(2i + 3j + 6k)$   
 (C)  $\frac{1}{7}(2i - 3j + 6k)$  (D) None
16. A
17. The system of equations  $x + 2y + 3z = 4$ ,  $2x + 3y + 4z = 5$ ,  $3x + 4y + 5z = 6$  has  
 (A) Infinitely many solution (B) No solution  
 (C) Unique solutions (D) None of these
17. A
18. The sum of the real roots of the equation  

$$\begin{vmatrix} x & -6 & -1 \\ 2 & -3x & x-3 \\ -3 & 2x & x=2 \end{vmatrix} = 0$$
 is equal to  
 (A) -4 (B) 0  
 (C) 6 (D) 1
18. B
19. If A is a symmetric matrix and B is a skew-symmetric matrix such that  $A + B = \begin{bmatrix} 2 & 3 \\ 5 & -1 \end{bmatrix}$ , then AB is equal to :  
 (A)  $\begin{bmatrix} 4 & -2 \\ 1 & -4 \end{bmatrix}$  (B)  $\begin{bmatrix} 4 & -2 \\ -1 & -4 \end{bmatrix}$   
 (C)  $\begin{bmatrix} -4 & 2 \\ 1 & 4 \end{bmatrix}$  (D)  $\begin{bmatrix} -4 & -2 \\ -1 & 4 \end{bmatrix}$
19. B
20. If  $\begin{vmatrix} x+1 & x+2 & x+a \\ x+2 & x+3 & x+b \\ x+3 & x+4 & x+c \end{vmatrix} = 0$ , then a, b, c are in  
 (A) A.P (B) G.P  
 (C) H.P (D) none of these

20. A

**PART-B**  
**Numerical Type**

1. If the line  $\frac{x-1}{1} = \frac{y+1}{-2} = \frac{z+1}{\lambda}$  lies in the plane  $3x - 2y + 5z = 0$ , then  $\lambda$  is equal to

1. -1.4

2. Given that  $\begin{vmatrix} 1 & a & a^3 \\ 1 & b & b^3 \\ 1 & c & c^3 \end{vmatrix} = (a-b)(b-c)(c-a)(a+b+c)$ , the value of  $\begin{vmatrix} 1 & 1 & 1 \\ 2 & 3 & 4 \\ 8 & 27 & 64 \end{vmatrix}$  is

2. 18

3. Centroid of the tetrahedron OABC, where  $A \equiv (a, 2, 3)$ ,  $B \equiv (1, b, 2)$ ,  $C \equiv (2, 1, c)$  and O is the origin is  $(1, 2, 3)$ . The value of  $a^2 + b^2 + c^2$  is equal to

3. 75

4.  $\frac{dy}{dx} + \frac{2y}{x} = 0$ ,  $y(1) = 1$ , then  $y(2) =$

4. 0.25

5. If  $x dy = y(dx + y dy)$ ,  $y > 0$  and  $y(1) = 1$  and  $y(x_0) = -3$ , then  $|x_0| =$

5. 15

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# FIITJEE INTERNAL TEST

BATCHES:

PHYSICS, CHEMISTRY & MATHEMATICS

JEE MAIN-PHASE-IV

Paper Code

ANSWER KEY

SECTION – I

(PHYSICS)

PART – A

PART – B

SECTION – II  
(CHEMISTRY)

PART – A

PART – B

SECTION – III  
(MATHEMATICS)

PART – A

PART – B