

JEE (Main)
Sample Question Paper

Subjects	Physics, Chemistry and Mathematics
Total Number of Questions	75
Maximum Marks	300
Time Allowed	3 Hours

Marking Scheme (As per JEE Main Pattern)

Each question carries **4 (four) marks**.

1 (one) mark will be deducted for each incorrect answer.

No marks will be deducted for unattempted questions.

Only one option is correct for each question.

Important Instructions

1. This Question Paper consists of **75 Multiple Choice Questions**.
2. The paper contains **25 questions each from Physics, Chemistry and Mathematics**.
3. All questions are compulsory.
4. Rough work should be done only in the space provided in the Question Paper.
5. Calculators, mobile phones, smart watches, or any electronic devices are strictly prohibited.

Name of the Candidate (Capital Letters)	
Roll Number	
Examination Centre Name	
Candidate's Signature	Date

Invigilator's Signature

JEE MAIN PHYSICS ANSWER KEY

1. (B)	2. (A)	3. (A)	4. (C)	5. (A)
6. (A)	7. (C)	8. (B)	9. (A)	10. (D)
11. (B)	12. (B)	13. (A)	14. (A)	15. (A)
16. (A)	17. (A)	18. (B)	19. (C)	20. (A)
21. (B)	22. (D)	23. (A)	24. (D)	25. (D)

CHEMISTRY

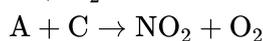
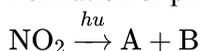
1. The alkaline earth metal sulphate(s) which are readily soluble in water is/are:

- (a) BeSO_4
- (b) MgSO_4
- (c) CaSO_4
- (d) SrSO_4
- (e) BaSO_4

Choose the correct answer from the options given below:

- A) Only a and b
- B) Only a, b, c
- C) Only d and e
- D) Only a and e

2. Formation of photochemical smog involves the following reaction in which A, B, and C are respectively:



Choose the correct answer from the options given below:

- A) NO, O, and O_3
- B) N_2O and NO
- C) N, O_2 , and O_3
- D) O, NO, and NO_3

3. In the wet tests for identification of various cations by precipitation, which transition element cation doesn't belong to group IV in qualitative inorganic analysis?

- A) Fe^{3+}
- B) Zn^{2+}
- C) Co^{2+}
- D) Ni^{2+}

4. Number of cyclic tripeptides formed with 2 amino acids A and B is:

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

5. The magnetic behavior of Li_2O , Na_2O_2 and KO_2 , respectively, are

- A) Paramagnetic, paramagnetic and diamagnetic
- B) Diamagnetic, diamagnetic and paramagnetic
- C) Paramagnetic, diamagnetic and paramagnetic
- D) Diamagnetic, paramagnetic and diamagnetic

6. The set of correct statements is :

- (i) Manganese exhibits +7 oxidation state in its oxide.
- (ii) Ruthenium and Osmium exhibit +8 oxidation in their oxides.
- (iii) Sc shows +4 oxidation state which is oxidizing in nature.
- (iv) Cr shows oxidising nature in +6 oxidation state.

- A) (ii) and (iii)
- B) (i), (ii) and (iv)
- C) (ii), (iii) and (iv)
- D) (i) and (iii)

7. "A" obtained by Ostwald's method involving air oxidation of NH_3 , upon further air oxidation produces "B". "B" on hydration forms an oxoacid of Nitrogen along with evolution of "A". The oxoacid also produces "A" and gives positive brown ring test.

- A) NO, NO_2
- B) N_2O_3 , NO_2
- C) NO_2 , N_2O_4
- D) NO_2 , N_2O_5

8. "A" obtained by Ostwald's method involving air oxidation of NH_3 , upon further air oxidation produces "B". "B" on hydration forms an oxoacid of Nitrogen along with evolution of "A". The oxoacid also produces "A" and gives positive brown ring test.

A) NO, NO_2

B) N_2O_3, NO_2

C) NO_2, N_2O_4

D) NO_2, N_2O_5

9. The pair of compounds from the following pairs having both the compounds with net non-zero dipole moment is

A) Cis-dichloroethene; trans-dichloroethene

B) $CH_2Cl_2; CHCl_3$

C) 1,4-dichlorobenzene; 1,3,5-trichlorobenzene

D) Benzene; p-Anisidine

10. The alkaline earth metal sulphate(s) which are readily soluble in water is/are:

(a) $BeSO_4$

(b) $MgSO_4$

(c) $CaSO_4$

(d) $SrSO_4$

(e) $BaSO_4$

Choose the correct answer from the options given below:

A) Only a and b

B) Only a, b, c

C) Only d and e

D) Only a and e

11. Suitable reaction condition for preparation of Methyl phenyl ether is

A) $PhO^- Na^+, MeBr$

B) $PhO^- Na^+, MeOH$

C) $Ph-Br, MeO^- Na^+$

D) Benzene, $MeBr$

12. The concentration of dissolved Oxygen in water for growth of fish should be more than X ppm and Biochemical Oxygen Demand in clean water should be less than Y ppm. X and Y in ppm are, respectively.

A) $X Y$

B) $X Y$

4 8

6 5

C) $X Y$

D) $X Y$

4 15

6 12

13. Which of the following salt solutions would coagulate the colloid solution formed when $FeCl_3$ is added to $NaOH$ solution, at the fastest rate?

A) 10 mL of $0.1 \text{ mol dm}^{-3} Ca_3(PO_4)_2$

B) 10 mL of $0.2 \text{ mol dm}^{-3} AlCl_3$

C) 10 mL of $0.1 \text{ mol dm}^{-3} Na_2SO_4$

D) 10 mL of $0.15 \text{ mol dm}^{-3} CaCl_2$

14. Match List I and List II

List I

A. van't Hoff factor, i

B. k_f

C. Solution with same π with same osmotic pressure

D. Azeotropes

List II

I. Cryoscopic constant

II. Isotonic solutions

III. Normal molar mass / Abnormal molar mass

IV. Solutions with same composition of vapour above it

Choose the correct answer from the options given below :

A) A-I, B-III, C-II, D-IV

B) A-III, B-I, C-IV, D-II

C) A-III, B-I, C-II, D-IV

D) A-III, B-II, C-I, D-IV

JEE MAIN CHEMISTRY ANSWER KEY

1. (A)	2. (A)	3. (A)	4. (B)	5. (B)
6. (B)	7. (A)	8. (A)	9. (B)	10. (A)
11. (A)	12. (B)	13. (B)	14. (C)	15. (B)
16. (A)	17. (A)	18. (D)	19. (B)	20. (A)
21. (A)	22. (B)	23. (B)	24. (C)	25. (B)

18. If the system of equations
 $2x + y - z = 5$
 $2x - 5y + \lambda z = \mu$
 $x + 2y - 5z = 7$
has infinitely many solutions, then $(\lambda + \mu)^2 + (\lambda - \mu)^2$ is equal to
A) 904 B) 912
C) 916 D) 920
19. Let N be the foot of perpendicular from the point P (1, -2, 3) on the line passing through the points (4, 5, 8) and (1, -7, 5). Then the distance of N from the plane $2x - 2y + z + 5 = 0$ is
A) 6 B) 7
C) 8 D) 9
20. If the tangents at the points P and Q on the circle $x^2 + y^2 - 2x + y = 5$ meet at the point R $(\frac{9}{4}, 2)$ then the area of the triangle PQR is
A) $\frac{13}{8}$ B) $\frac{13}{4}$
C) $\frac{5}{8}$ D) $\frac{5}{4}$
21. Let $y = f(x)$ be the solution of the differential equation $y(x + 1)dx - x^2dy = 0$, $y(1) = e$. Then $\lim_{x \rightarrow 0^-} f(x)$ is equal to
A) $1/e$ B) 0
C) $1/e^2$ D) e^2
22. If $f : \mathbb{R} \rightarrow \mathbb{R}$ be a continuous function satisfying $\int_0^{\frac{\pi}{2}} f(\sin 2x) \sin x dx + \alpha \int_0^{\frac{\pi}{4}} f(\cos 2x) \cos x dx = 0$, then the value of α is
A) $-\sqrt{3}$ B) $\sqrt{3}$
C) $-\sqrt{2}$ D) $\sqrt{2}$
23. Let for a triangle ABC,
 $\vec{AB} = -2\hat{i} + \hat{j} + 3\hat{k}$
 $\vec{CB} = \alpha\hat{i} + \beta\hat{j} + \gamma\hat{k}$
 $\vec{CA} = 4\hat{i} + 3\hat{j} + \delta\hat{k}$
If $\delta > 0$ and the area of the triangle ABC is $5\sqrt{6}$, then $\vec{CB} \cdot \vec{CA}$ is equal to
A) 60 B) 54
C) 120 D) 108
24. Let $|\vec{a}| = 2$, $|\vec{b}| = 3$ and the angle between the vectors \vec{a} and \vec{b} be $\frac{\pi}{4}$. Then $|(\vec{a} + 2\vec{b}) \times (2\vec{a} - 3\vec{b})|^2$ is equal to
A) 441 B) 882
C) 482 D) 841
25. Let $S = w_1, w_2, \dots$ be the sample space associated to a random experiment. Let $P(w_n) = \frac{P(w_{n-1})}{2}$, $n \geq 2$. Let $A = \{2k + 3l : k, l \in \mathbb{N}\}$ and $B = \{w_n : n \in A\}$. Then $P(B)$ is equal to
A) $\frac{3}{64}$ B) $\frac{1}{16}$
C) $\frac{1}{32}$ D) $\frac{3}{32}$

JEE MAIN MATHEMATICS ANSWER KEY

1. (D)	2. (B)	3. (D)	4. (C)	5. (B)
6. (A)	7. (A)	8. (D)	9. (C)	10. (D)
11. (C)	12. (D)	13. (B)	14. (C)	15. (C)
16. (C)	17. (D)	18. (C)	19. (B)	20. (C)
21. (B)	22. (C)	23. (A)	24. (B)	25. (A)