

JEE Advanced

Sample Question Paper - 2025

Country: IN | Duration: 3 hours/paper | Max Marks: 180 | Language: Hindi

Negative Marking: Yes (-1 or -2) | Total Questions: 54 | QuizVerse AI Tutor

General Instructions:

1. This paper contains 54 questions across 3 section(s): Physics, Chemistry, Mathematics.
2. Duration: 3 hours/paper. Maximum marks: 180.
3. Negative marking: Yes (-1 or -2).
4. Read each question carefully before answering.

Section 1: Physics (18 Questions)

Q1. A solenoid of 145 turns and length 0.1 m carries current 4 A. The magnetic field inside is:

- (A) 1.19 mT
- (B) 16.56 mT
- (C) 17.15 mT
- (D) 9.69 mT

Q2. A wire of resistance 11 ohm is bent into a circle. Effective resistance between diametrically opposite points is:

- (A) 2 ohm
- (B) 3 ohm
- (C) 4 ohm
- (D) 7 ohm

Q3. A radioactive substance has half-life 20 days. The fraction remaining after 14 days is:

- (A) $1/32$
- (B) $1/16$
- (C) $1/16$
- (D) $1/4$

Q4. A ball is dropped from height 90 m. Its velocity just before hitting the ground is:

- (A) 28.3 m/s
- (B) 32.6 m/s
- (C) 35.8 m/s
- (D) 35.0 m/s

Q5. An ideal gas at 292 K is heated at constant pressure to 489 K. The ratio of final to initial volume is:

- (A) 2.1
- (B) 2.7
- (C) 2.3
- (D) 2.1

Q6. The binding energy per nucleon of Fe-56 is approximately:

- (A) 8.8 MeV
- (B) 7.6 MeV
- (C) 6.5 MeV
- (D) 9.2 MeV

Q7. A car of mass 1565 kg moving at 25 m/s brakes to rest in 7 s. The braking force is:

- (A) 17916 N
- (B) 6209 N
- (C) 6477 N
- (D) 15156 N

Q8. The binding energy per nucleon of Fe-56 is approximately:

- (A) 7.6 MeV
- (B) 6.5 MeV
- (C) 8.8 MeV
- (D) 9.2 MeV

Q9. A Carnot engine operates between 765 K and 266 K. Its efficiency is:

- (A) 35%
- (B) 56%
- (C) 25%
- (D) 52%

Q10. A block of mass 6 kg slides down a frictionless incline of angle 37 degrees. The acceleration is:

- (A) 5.2 m/s²
- (B) 6.8 m/s²
- (C) 6.6 m/s²
- (D) 4.1 m/s²

Q11. The current through a 11 ohm resistor connected to a 12 V battery is:

- (A) 2.51 A
- (B) 2.22 A
- (C) 2.50 A
- (D) 2.81 A

Q12. The electric field at 3 m from a point charge of 6 uC is:

- (A) 672 N/C
- (B) 8811 N/C
- (C) 1784 N/C
- (D) 7047 N/C

Q13. The current through a 26 ohm resistor connected to a 15 V battery is:

- (A) 2.36 A
- (B) 1.89 A
- (C) 2.83 A
- (D) 0.50 A

Q14. A radioactive substance has half-life 14 days. The fraction remaining after 54 days is:

- (A) $1/8$
- (B) $1/4$
- (C) $1/4$
- (D) $1/16$

Q15. Two masses 7 kg and 11 kg are connected by a string over a frictionless pulley. The acceleration of the system is:

- (A) 2.57 m/s^2
- (B) 3.15 m/s^2
- (C) 5.61 m/s^2
- (D) 3.18 m/s^2

Q16. A car of mass 1593 kg moving at 44 m/s brakes to rest in 9 s. The braking force is:

- (A) 4174 N
- (B) 16867 N
- (C) 15289 N
- (D) 3916 N

Q17. A Carnot engine operates between 765 K and 254 K. Its efficiency is:

- (A) 52%
- (B) 65%
- (C) 58%
- (D) 30%

Q18. A wire of resistance 19 ohm is bent into a circle. Effective resistance between diametrically opposite points is:

- (A) 2 ohm
- (B) 6 ohm
- (C) 8 ohm
- (D) 8 ohm

Section 2: Chemistry (18 Questions)

Q19. Kolbe's electrolysis of sodium acetate gives:

- (A) Methane
- (B) Propane
- (C) Butane
- (D) Ethane

Q20. For an ideal gas, $C_p - C_v$ equals:

- (A) $R/2$
- (B) R (8.314 J/mol K)
- (C) $2R$
- (D) 0

Q21. Which element has the highest electronegativity?

- (A) Fluorine
- (B) Oxygen
- (C) Chlorine
- (D) Nitrogen

Q22. The order of ionic radius: Na^+ vs Mg^{2+} vs Al^{3+} is:

- (A) $\text{Al}^{3+} > \text{Mg}^{2+} > \text{Na}^+$
- (B) $\text{Mg}^{2+} > \text{Na}^+ > \text{Al}^{3+}$
- (C) $\text{Na}^+ > \text{Mg}^{2+} > \text{Al}^{3+}$
- (D) All equal

Q23. The lightest noble gas is:

- (A) Krypton
- (B) Helium
- (C) Argon
- (D) Neon

Q24. Friedel-Crafts acylation uses which catalyst?

- (A) FeCl_3
- (B) CuCl_2
- (C) ZnCl_2
- (D) AlCl_3

Q25. The magnetic moment of Fe^{2+} (d^6) in weak field is:

- (A) 2.83 BM
- (B) 5.9 BM
- (C) 0 BM
- (D) 4.9 BM (4 unpaired)

Q26. The pH of a 0.01 M HCl solution is:

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

Q27. For a first-order reaction with $k = 0.074 \text{ s}^{-1}$, the half-life is:

- (A) 10.0 s
- (B) 13.9 s
- (C) 15.0 s
- (D) 20.0 s

Q28. The van't Hoff factor for NaCl is approximately:

- (A) 0.5
- (B) 2
- (C) 3
- (D) 1

Q29. Perkin reaction produces:

- (A) Alpha,beta-unsaturated acids
- (B) Ethers
- (C) Amines
- (D) Alcohols

Q30. According to Raoult's law, the vapour pressure of a solvent in solution is:

- (A) $p = p_0 / x_{\text{solvent}}$
- (B) $p = RT/V$
- (C) $p = p_0 * x_{\text{solvent}}$
- (D) $p = p_0 * x_{\text{solute}}$

Q31. The rate of reaction doubles when temperature increases by:

- (A) 50 K
- (B) 10 K
- (C) 5 K
- (D) 20 K

Q32. The IUPAC name of neopentane is:

- (A) 2-Methylbutane
- (B) 2,2-Dimethylpropane
- (C) Cyclopentane
- (D) Pentane

Q33. VSEPR theory predicts the shape of SF₆ as:

- (A) Square planar
- (B) Tetrahedral
- (C) Trigonal bipyramidal
- (D) Octahedral

Q34. The hybridization of C in acetylene is:

- (A) sp
- (B) sp³d
- (C) sp³
- (D) sp²

Q35. According to Raoult's law, the vapour pressure of a solvent in solution is:

- (A) $p = p_0 / x_{\text{solvent}}$
- (B) $p = p_0 * x_{\text{solvent}}$
- (C) $p = p_0 * x_{\text{solute}}$
- (D) $p = RT/V$

Q36. The IUPAC name of CH₃CH(OH)CH₃ is:

- (A) Isopropyl ether
- (B) Propan-1-ol
- (C) Propan-2-ol
- (D) 2-Methylethanol

Section 3: Mathematics (18 Questions)

Q37. If $\det(A) = 8$ and A is 3×3 , then $\det(2A) =$

- (A) 44
- (B) 77
- (C) 98
- (D) 52

Q38. The eccentricity of the ellipse $x^2/19 + y^2/2 = 1$ is:

- (A) 0.70
- (B) 0.84
- (C) 0.58
- (D) 0.34

Q39. The rank of the matrix $[[1,2,3],[4,5,6],[7,9,13]]$ is:

- (A) 2
- (B) 3
- (C) 1
- (D) 0

Q40. The derivative of $x^5 \sin(x)$ at $x = \pi$ is:

- (A) 17.80
- (B) 11.55
- (C) -17.43
- (D) -0.65

Q41. The mean of a binomial distribution with $n = 43$ and $p = 0.5$ is:

- (A) 37.9
- (B) 26.4
- (C) 39.2
- (D) 20.5

Q42. $\lim_{x \rightarrow 0} \sin(5x)/x =$

- (A) 1
- (B) 3
- (C) 6
- (D) 3

Q43. The equation of tangent to $y = x^3$ at $x = 2$ is:

- (A) $y = 11x - 16$
- (B) $y = 2x - 2$
- (C) $y = 9x - 12$
- (D) $y = 3x - 9$

Q44. The distance between parallel lines $5x + 2y = 6$ and $2x + 4y = 18$ is:

- (A) 2.11
- (B) 4.16
- (C) 2.76
- (D) 0.57

Q45. The sum of first 40 terms of AP with $a = 5$, $d = 1$ is:

- (A) 4410
- (B) 3946
- (C) 3093
- (D) 3958

Q46. The value of integral $\sin^4(x) dx$ from 0 to $\pi/2$ is:

- (A) $4\pi/32$
- (B) $13\pi/32$
- (C) $5\pi/4$
- (D) $14\pi/4$

Q47. The mean of a binomial distribution with $n = 19$ and $p = 0.5$ is:

- (A) 17.5
- (B) 10.8
- (C) 8.7
- (D) 24.6

Q48. The sum of first 22 terms of AP with $a = 3$, $d = 4$ is:

- (A) 3114
- (B) 3166
- (C) 2203
- (D) 2828

Q49. The distance between parallel lines $4x + 3y = 10$ and $2x + 4y = 12$ is:

- (A) 3.08
- (B) 4.75
- (C) 4.25
- (D) 4.15

Q50. The number of ways to arrange 7 distinct objects in a circle is:

- (A) 4480
- (B) 3909
- (C) 570
- (D) 1166

Q51. The number of ways to arrange 3 distinct objects in a circle is:

- (A) 1188
- (B) 621
- (C) 2236
- (D) 4624

Q52. The area under $y = x^4$ from $x = 0$ to $x = 5$ is:

- (A) 135.5
- (B) 15.9
- (C) 132.3
- (D) 24.4

Q53. Integral of $(x^4 + 8)$ dx from 0 to 2 equals:

- (A) 97
- (B) 18
- (C) 59
- (D) 48

Q54. Integral of $(x^1 + 6)$ dx from 0 to 5 equals:

- (A) 65
- (B) 81
- (C) 75
- (D) 63

Answer Key

Q1: (C)	Q2: (A)	Q3: (A)	Q4: (D)	Q5: (B)
Q6: (A)	Q7: (A)	Q8: (C)	Q9: (C)	Q10: (A)
Q11: (D)	Q12: (A)	Q13: (A)	Q14: (A)	Q15: (D)
Q16: (A)	Q17: (A)	Q18: (C)	Q19: (D)	Q20: (B)
Q21: (A)	Q22: (C)	Q23: (B)	Q24: (D)	Q25: (D)
Q26: (B)	Q27: (B)	Q28: (B)	Q29: (A)	Q30: (C)
Q31: (B)	Q32: (B)	Q33: (D)	Q34: (A)	Q35: (B)
Q36: (C)	Q37: (D)	Q38: (A)	Q39: (A)	Q40: (D)
Q41: (A)	Q42: (A)	Q43: (C)	Q44: (C)	Q45: (B)
Q46: (B)	Q47: (C)	Q48: (C)	Q49: (C)	Q50: (D)
Q51: (B)	Q52: (B)	Q53: (A)	Q54: (A)	

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