JEE Advanced

Sample Question Paper - 2025

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

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/s^2

(B) 6.8 m/s^2

(C) 6.6 m/s^2

(D) 4.1 m/s^2

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, Cp - Cv 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 Mg2+ vs Al3+ is:

(A) Al3+ > Mg2+ > Na+

(B) Mg2+ > Na+ > Al3+

(C) Na+ > Mg2+ > Al3+

(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) FeCl3

(B) CuCl2

(C) ZnCl2

(D) AlCl3

Q25. The magnetic moment of Fe2+ (d6) 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 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 = p0 / x_solvent

(B) p = RT/V

(C) p = p0 * x_solvent

(D) p = p0 * x_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 = p0 / x_solvent

(B) p = p0 * x_solvent

(C) p = p0 * x_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 3x3, 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->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) 4pi/32

(B) 13pi/32

(C) 5pi/4

(D) 14pi/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)	