

# JEE Main

## Sample Question Paper - 2026

Country: IN | Duration: 3 hours | Max Marks: 300 | Language: English

Negative Marking: Yes (-1) | Total Questions: 75 | QuizVerse AI Tutor

### General Instructions:

1. This paper contains 75 questions across 3 section(s): Physics, Chemistry, Mathematics.
2. Duration: 3 hours. Maximum marks: 300.
3. Negative marking: Yes (-1).
4. Read each question carefully before answering.

### Section 1: Physics (25 Questions)

**Q1. A radioactive substance has half-life 14 days. The fraction remaining after 54 days is:**

- (A)  $\frac{1}{4}$
- (B)  $\frac{1}{16}$
- (C)  $\frac{1}{8}$
- (D)  $\frac{1}{4}$

**Q2. A car of mass 1565 kg moving at 25 m/s brakes to rest in 7 s. The braking force is:**

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

**Q3. A wire of resistance 19 ohm is bent into a circle. Effective resistance between diametrically opposite points is:**

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

**Q4. A solenoid of 145 turns and length 0.1 m carries current 4 A. The magnetic field inside is:**

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

**Q5. The escape velocity from a planet of mass  $4 \times 10^{24}$  kg and radius 7718 km is:**

- (A) 9.0 km/s
- (B) 8.9 km/s
- (C) 13.2 km/s
- (D) 14.0 km/s

**Q6. A ball is dropped from height 90 m. Its velocity just before hitting the ground is:**

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

**Q7. A solenoid of 268 turns and length 0.2 m carries current 10 A. The magnetic field inside is:**

- (A) 17.10 mT
- (B) 13.54 mT
- (C) 2.75 mT
- (D) 15.17 mT

**Q8. A wire of resistance 11 ohm is bent into a circle. Effective resistance between diametrically opposite points is:**

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

**Q9. A Carnot engine operates between 765 K and 254 K. Its efficiency is:**

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

**Q10. A body of mass 4 kg is moving in a circle of radius 8 m at 19 m/s. The centripetal force is:**

- (A) 124 N
- (B) 65 N
- (C) 176 N
- (D) 146 N

**Q11. A Carnot engine operates between 781 K and 324 K. Its efficiency is:**

- (A) 51%
- (B) 54%
- (C) 60%
- (D) 28%

**Q12. The focal length of a concave mirror is 17 cm. An object at 30 cm forms image at:**

- (A) 43 cm, real inverted
- (B) 32 cm, real inverted
- (C) 17 cm, real inverted
- (D) 23 cm, real inverted

**Q13. The focal length of a concave mirror is 21 cm. An object at 25 cm forms image at:**

- (A) 47 cm, real inverted
- (B) 34 cm, real inverted
- (C) 15 cm, real inverted
- (D) 53 cm, real inverted

**Q14. Two masses 7 kg and 11 kg are connected by a string over a frictionless pulley. The acceleration of the system is:**

- (A)  $5.61 \text{ m/s}^2$
- (B)  $2.57 \text{ m/s}^2$
- (C)  $3.18 \text{ m/s}^2$
- (D)  $3.15 \text{ m/s}^2$

**Q15. An ideal gas at 295 K is heated at constant pressure to 678 K. The ratio of final to initial volume is:**

- (A) 2.4
- (B) 2.3
- (C) 1.5
- (D) 1.5

**Q16. The binding energy per nucleon of Fe-56 is approximately:**

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

**Q17. A force of 64 N acts on a 17 kg body initially at rest. The velocity after 4 s is:**

- (A) 49 m/s
- (B) 7 m/s
- (C) 37 m/s
- (D) 26 m/s

**Q18. A convex lens of focal length 18 cm forms a real image of an object placed 46 cm away. The image distance is:**

- (A) 34 cm
- (B) 19 cm
- (C) 35 cm
- (D) 25 cm

**Q19. A spring with  $k = 494 \text{ N/m}$  is compressed by 0.17 m. The stored PE is:**

- (A) 16.40 J
- (B) 20.63 J
- (C) 18.25 J
- (D) 22.76 J

**Q20. The de Broglie wavelength of an electron accelerated through 50 V is approximately:**

- (A) 2.95 Angstrom
- (B) 2.48 Angstrom
- (C) 2.67 Angstrom
- (D) 1.06 Angstrom

**Q21. An electron moves with velocity  $1 \times 10^6 \text{ m/s}$  perpendicular to a magnetic field of 0.3 T. The radius of its path is:**

- (A) 1.71 cm
- (B) 0.95 cm
- (C) 2.09 cm
- (D) 0.80 cm

**Q22. The de Broglie wavelength of an electron accelerated through 50 V is approximately:**

- (A) 1.17 Angstrom
- (B) 1.32 Angstrom
- (C) 1.07 Angstrom
- (D) 2.55 Angstrom

**Q23. A block of mass 6 kg slides down a frictionless incline of angle 37 degrees. The acceleration is:**

- (A) 4.1 m/s<sup>2</sup>
- (B) 6.6 m/s<sup>2</sup>
- (C) 6.8 m/s<sup>2</sup>
- (D) 5.2 m/s<sup>2</sup>

**Q24. A Carnot engine operates between 765 K and 266 K. Its efficiency is:**

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

**Q25. The work function of a metal is 1.6 eV. The threshold frequency is:**

- (A)  $10.62 \times 10^{14}$  Hz
- (B)  $3.11 \times 10^{14}$  Hz
- (C)  $9.14 \times 10^{14}$  Hz
- (D)  $11.96 \times 10^{14}$  Hz

## Section 2: Chemistry (25 Questions)

**Q26. According to Raoult's law, the vapour pressure of a solvent in solution is:**

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

**Q27. The equilibrium constant  $K_p$  and  $K_c$  are related by:**

- (A)  $K_p = K_c(RT)^{\Delta n}$
- (B)  $K_p = K_c$
- (C)  $K_p = K_c/RT$
- (D)  $K_p = RT * K_c$

**Q28. The coordination number in BCC is:**

- (A) 8
- (B) 6
- (C) 4
- (D) 12

**Q29. Grignard reagents react with dry CO<sub>2</sub> to give:**

- (A) Esters
- (B) Carboxylic acids
- (C) Ketones
- (D) Alcohols

**Q30. Which of the following has the highest lattice energy?**

- (A) NaF
- (B) NaI
- (C) NaCl
- (D) NaBr

**Q31. The reagent for converting aldehyde to carboxylic acid is:**

- (A) Zn-Hg / HCl
- (B)  $\text{KMnO}_4$  /  $\text{K}_2\text{Cr}_2\text{O}_7$
- (C)  $\text{LiAlH}_4$
- (D)  $\text{NaBH}_4$

**Q32. Which metal is extracted by thermite process?**

- (A) Chromium
- (B) Aluminium
- (C) Iron
- (D) Sodium

**Q33. The van't Hoff factor for NaCl is approximately:**

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

**Q34. According to Raoult's law, the vapour pressure of a solvent in solution is:**

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

**Q35. Kolbe's electrolysis of sodium acetate gives:**

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

**Q36. The IUPAC name of  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$  is:**

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

**Q37. The hybridization of C in acetylene is:**

- (A) sp
- (B)  $\text{sp}^3$
- (C)  $\text{sp}^3\text{d}$
- (D)  $\text{sp}^2$

**Q38. Lanthanide contraction is caused by:**

- (A) High ionization energy
- (B) Electron capture
- (C) Nuclear fusion
- (D) Poor shielding by 4f electrons

**Q39. The cell potential for  $\text{Zn}|\text{Zn}^{2+}||\text{Cu}^{2+}|\text{Cu}$  cell is:**

- (A) -0.76 V
- (B) 1.10 V
- (C) 0.34 V
- (D) 0.76 V

**Q40. For an endothermic reaction, increasing temperature:**

- (A) Decreases equilibrium constant
- (B) Increases equilibrium constant
- (C) Decreases rate
- (D) No effect

**Q41. The ore of aluminium is:**

- (A) Bauxite
- (B) Chalcopyrite
- (C) Galena
- (D) Haematite

**Q42. Hess's law states that:**

- (A) Enthalpy change is path independent
- (B) Volume is constant
- (C) Entropy always increases
- (D) Rate depends on concentration

**Q43. For an ideal gas,  $C_p - C_v$  equals:**

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

**Q44. The IUPAC name of neopentane is:**

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

**Q45. The entropy change for an irreversible process is:**

- (A) Greater than  $q_{\text{rev}}/T$
- (B) Negative always
- (C) Equal to  $q/T$
- (D) Zero

**Q46. Markovnikov's rule applies to the addition of HBr to:**

- (A) Benzene
- (B) Propene
- (C) Ethene
- (D) Methane

**Q47. The order of ionic radius:  $\text{Na}^+$  vs  $\text{Mg}^{2+}$  vs  $\text{Al}^{3+}$  is:**

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

**Q48. Wurtz reaction involves coupling of:**

- (A) Aldehydes with NaOH
- (B) Alkyl halides with Na
- (C) Aryl halides with Cu
- (D) Acids with  $\text{SOCl}_2$

**Q49. For a first-order reaction with  $k = 0.074 \text{ s}^{-1}$ , the half-life is:**

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

**Q50. The rate of reaction doubles when temperature increases by:**

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

### Section 3: Mathematics (25 Questions)

**Q51. The derivative of  $x^3 \sin(x)$  at  $x = \pi$  is:**

- (A) -18.89
- (B) -6.35
- (C) 15.80
- (D) -10.50

**Q52. The number of ways to arrange 7 distinct objects in a circle is:**

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

**Q53. The rank of the matrix  $\begin{bmatrix} 1,2,3 \\ 4,5,6 \\ 8,10,11 \end{bmatrix}$  is:**

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

**Q54. The derivative of  $x^2 \sin(x)$  at  $x = \pi$  is:**

- (A) -10.70
- (B) 5.37
- (C) 16.30
- (D) 11.37

**Q55. The area under  $y = x^4$  from  $x = 0$  to  $x = 5$  is:**

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

**Q56. The probability of getting exactly 4 heads in 5 tosses of a fair coin is:**

- (A)  $36/64$
- (B)  $43/32$
- (C)  $14/32$
- (D)  $20/256$

**Q57. The eccentricity of the ellipse  $x^2/4 + y^2/6 = 1$  is:**

- (A) 0.69
- (B) 0.55
- (C) 0.59
- (D) 0.38

**Q58.  $\lim_{x \rightarrow 0} \sin(2x)/x =$**

- (A) 6
- (B) 1
- (C) 5
- (D) 5

**Q59. Integral of  $(x^1 + 6) dx$  from 0 to 5 equals:**

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

**Q60. The derivative of  $x^6 \sin(x)$  at  $x = \pi$  is:**

- (A) -18.08
- (B) 18.32
- (C) -17.63
- (D) -1.45

**Q61. The area under  $y = x^2$  from  $x = 0$  to  $x = 4$  is:**

- (A) 164.8
- (B) 155.7
- (C) 46.0
- (D) 73.5

**Q62. The eccentricity of the ellipse  $x^2/19 + y^2/2 = 1$  is:**

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

**Q63. The distance between parallel lines  $4x + 3y = 2$  and  $3x + 2y = 16$  is:**

- (A) 3.17
- (B) 2.95
- (C) 4.36
- (D) 4.33

**Q64. The eccentricity of the ellipse  $x^2/8 + y^2/7 = 1$  is:**

- (A) 0.84
- (B) 0.50
- (C) 0.63
- (D) 0.85

**Q65.  $\lim_{x \rightarrow 0} \sin(5x)/x =$**

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

**Q66. Integral of  $(x^4 + 8) dx$  from 0 to 2 equals:**

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

**Q67. The mean of a binomial distribution with  $n = 41$  and  $p = 0.6$  is:**

- (A) 25.0
- (B) 15.7
- (C) 25.1
- (D) 3.9

**Q68. The probability of getting exactly 2 heads in 7 tosses of a fair coin is:**

- (A)  $29/128$
- (B)  $37/128$
- (C)  $7/64$
- (D)  $23/64$

**Q69.  $\lim_{x \rightarrow 0} \sin(6x)/x =$**

- (A) 2
- (B) 2
- (C) 7
- (D) 5

**Q70. The derivative of  $x^5 \sin(x)$  at  $x = \pi$  is:**

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

**Q71. Integral of  $(x^3 + 1) dx$  from 0 to 1 equals:**

- (A) 33
- (B) 8
- (C) 99
- (D) 23

**Q72. The sum of first 40 terms of AP with  $a = 5$ ,  $d = 1$  is:**

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

**Q73. The sum of first 22 terms of AP with  $a = 1$ ,  $d = 1$  is:**

- (A) 218
- (B) 1919
- (C) 4913
- (D) 4744

**Q74. The equation of tangent to  $y = x^2$  at  $x = 1$  is:**

- (A)  $y = 8x - 2$
- (B)  $y = 3x - 7$
- (C)  $y = 8x - 17$
- (D)  $y = 8x - 3$

**Q75. The equation of tangent to  $y = x^3$  at  $x = 2$  is:**

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

# Answer Key

Q1: (C)	Q2: (D)	Q3: (A)	Q4: (A)	Q5: (C)
Q6: (B)	Q7: (C)	Q8: (A)	Q9: (B)	Q10: (D)
Q11: (D)	Q12: (A)	Q13: (A)	Q14: (C)	Q15: (C)
Q16: (A)	Q17: (D)	Q18: (D)	Q19: (A)	Q20: (D)
Q21: (D)	Q22: (C)	Q23: (D)	Q24: (D)	Q25: (D)
Q26: (C)	Q27: (A)	Q28: (A)	Q29: (B)	Q30: (A)
Q31: (B)	Q32: (A)	Q33: (A)	Q34: (A)	Q35: (C)
Q36: (C)	Q37: (A)	Q38: (D)	Q39: (B)	Q40: (B)
Q41: (A)	Q42: (A)	Q43: (C)	Q44: (A)	Q45: (A)
Q46: (B)	Q47: (A)	Q48: (B)	Q49: (C)	Q50: (C)
Q51: (D)	Q52: (B)	Q53: (B)	Q54: (D)	Q55: (D)
Q56: (D)	Q57: (B)	Q58: (A)	Q59: (B)	Q60: (B)
Q61: (A)	Q62: (C)	Q63: (C)	Q64: (B)	Q65: (C)
Q66: (A)	Q67: (C)	Q68: (D)	Q69: (A)	Q70: (B)
Q71: (C)	Q72: (B)	Q73: (C)	Q74: (A)	Q75: (B)

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