JEE Main 2027 Session 1 Application Correction Window Open

Complete revision pack for JEE Main 2027 Session 1 covering high-weightage PCM topics, golden shortcuts, and 20 ...

1. EXAM / NOTIFICATION KEY FACTS & DATES

Conducting Body	National Testing Agency (NTA)
Post / Course Name	JEE Main 2027 Session 1
Selection Process	JEE Main Score for NITs/IIITs & Qualification for JEE Advanced
Exam Mode & Duration	Computer-Based Test (CBT), 3 Hours (180 Minutes)
Key Subjects	Physics, Chemistry, Mathematics (30 Qs per subject, 25 to attempt)
Negative Marking	+4 for Correct Answer, -1 for Incorrect Answer

2. 4-STEP SMART PREPARATION PLAN

1. Phase 1: Clear fundamental concepts from NCERT and standard textbooks for Physics, Chemistry, and Math.
2. Phase 2: Master golden formulas, shortcut tricks, and solve 10-year previous year questions (PYQs).
3. Phase 3: Attempt full-length 3-hour CBT mock tests twice a week to build speed and accuracy.
4. Phase 4: Focus on application correction details, revise formula handbooks, and avoid new heavy topics.

3. SAMPLE GOLDEN SHORTCUTS & FORMULAS

* Shortcut 1 (Physics - De Broglie Wavelength): lambda (in Angstroms) for electron accelerated by voltage V is lambda = 12.27 / sqrt(V).
* Shortcut 2 (Physics - Projectile Range): Maximum horizontal range R_max = u^2 / g occurs at angle 45 deg; at complementary angles (theta and 90-theta), ranges are equal.
* Shortcut 3 (Physics - RC Circuit Time Constant): Time taken for capacitor to charge to 63.2% of max value is tau = R * C.
* Shortcut 4 (Physics - Polytropic Process Work): Work done W = (P1 V1 - P2 V2) / (n - 1) for process P V^n = constant.

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4. TOP 10 HIGH-WEIGHTAGE SYLLABUS TOPICS (QUICK SUMMARY)

1. Rotational Motion & Dynamics
Weightage: High (2-3 Qs)

Rotational motion involves moment of inertia, torque, and angular momentum conservation. Remember that Moment of Inertia depends on axis selection and mass distribution, using standard formulas like I = integral(r^2 d...

2. Electrostatics & Capacitance
Weightage: High (2-3 Qs)

Coulomb's Law, Gauss's Law, electric field intensity, and electrostatic potential form the core of electrostatics. Remember that Gauss's Law applies to closed symmetric surfaces where electric flux equals net enclosed...

3. Current Electricity & Magnetism
Weightage: High (3 Qs)

Kirchhoff's rules (KCL and KVL) govern circuit analysis along with Ohm's law. Drift velocity is related to current by I = n e A v_d. Magnetic field due to current-carrying conductors is calculated using Biot-Savart La...

4. Modern Physics & Atomic Structure
Weightage: High (3-4 Qs)

Modern physics yields direct scoring questions in photoelectric effect, Bohr's atomic model, and nuclear physics. Photoelectric equation is h nu = work function plus kinetic energy max. Bohr radius scales as n squared...

5. Chemical Kinetics & Thermodynamics
Weightage: High (2-3 Qs)

Chemical Kinetics deals with reaction rates, rate laws, and Arrhenius equation k = A e^(-Ea/RT). First-order reactions have integrated rate law k = (2.303/t) log(A0/A) and half-life t_half = 0.693/k independent of ini...

6. Coordination Compounds & d-Block
Weightage: High (2-3 Qs)

Coordination chemistry focuses on Werner's theory, IUPAC nomenclature, isomerism, and Crystal Field Theory (CFT). Crystal field splitting energy depends on ligand strength according to spectrochemical series. Weak fie...

7. Organic Reaction Mechanisms (GOC & Hydrocarbons)
Weightage: High (3-4 Qs)

General Organic Chemistry relies on inductive effect, resonance, hyperconjugation, and aromaticity rules. Carbokation stability orders: 3 deg > 2 deg > 1 deg due to hyperconjugation and inductive effect. Nucleophilic ...

8. Chemical Bonding & Molecular Structure
Weightage: High (2-3 Qs)

VSEPR theory predicts molecular shapes by minimizing electron pair repulsions around central atoms. Hybridization formula is H = half (V + M - C + A), where V is valence electrons, M is monovalent atoms, C is cation c...

9. Definite Integration & Area Under Curves
Weightage: High (2-3 Qs)

Definite integrals require mastering fundamental properties, King's property (integral from a to b f(x)dx = integral from a to b f(a+b-x)dx), and symmetry rules for even/odd functions. Area bounded by curves is determ...

10. Vector Algebra & 3D Geometry
Weightage: High (3-4 Qs)

Vector algebra covers dot product (a.b = |a||b| cos theta) and cross product (a x b = |a||b| sin theta n_cap), scalar triple product [a b c], and vector triple product. 3D geometry involves direction cosines, equation...

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5. 10 SAMPLE EXAM-STYLE PRACTICE MCQS (WITH ANSWERS)

Q1. A particle moves along a straight line such that its displacement x at time t is given by x = t^3 - 6t^2 + 9t + 4. What is the velocity of the particle when its acceleration is zero?
(A) 3 m/s (B) -3 m/s (C) 0 m/s (D) 6 m/s
Ans: (B) | Velocity v = dx/dt = 3t^2 - 12t + 9. Acceleration a = dv/dt = 6t - 12. Set a = 0 => 6t - 12 = 0 => t = 2 s. Substitute t = 2 into velocity formula: v = 3(2)^2 - 12(2) + 9 = 12 - 24 + 9 = -3 m/s.

Q2. A body of mass 2 kg is projected vertically upwards with speed 20 m/s. What is the work done by gravity during its upward motion till it reaches maximum height? (g = 10 m/s^2)
(A) -400 J (B) -200 J (C) 200 J (D) 400 J
Ans: (B) | Max height h = v^2 / (2g) = 400 / 20 = 20 m. Work done by gravity W = -mgh = - (2 kg) * (10 m/s^2) * (20 m) = -400 J? Wait: m=2, g=10, h=20 => W = -2 * 10 * 20 = -400 J. Wait, options: A is -400 J. Ans is A.

Q3. A moment of inertia of a uniform solid sphere of mass M and radius R about its tangent is:
(A) (2/5) M R^2 (B) (7/5) M R^2 (C) (3/5) M R^2 (D) (5/3) M R^2
Ans: (B) | Moment of inertia about diameter I_cm = (2/5) M R^2. By parallel axis theorem, I_tangent = I_cm + M R^2 = (2/5) M R^2 + M R^2 = (7/5) M R^2.

Q4. Two point charges +4 q and +q are separated by distance L. Where should a third positive charge Q be placed on the line joining them so that it experiences zero net force?
(A) L/3 from +4q (B) 2L/3 from +4q (C) L/4 from +4q (D) 3L/4 from +4q
Ans: (B) | Let Q be placed at distance x from +4q. Force equilibrium: k(4q)Q / x^2 = k(q)Q / (L-x)^2 => 4 / x^2 = 1 / (L-x)^2 => 2 / x = 1 / (L-x) => 2L - 2x = x => 3x = 2L => x = 2L/3.

Q5. A wire of resistance R is stretched such that its length becomes double its original length while volume remains constant. What is the new resistance?
(A) 2 R (B) R / 2 (C) 4 R (D) R / 4
Ans: (C) | Resistance R = rho * L / A. When length doubles (L' = 2L), area halves (A' = A/2) to keep volume constant. New resistance R' = rho * (2L) / (A/2) = 4 * (rho * L / A) = 4 R.

Q6. A convex lens of focal length 20 cm forms a real image of an object on a screen. If the image is twice the size of the object, what is the object distance?
(A) 30 cm (B) 10 cm (C) 15 cm (D) 40 cm
Ans: (A) | For real image, magnification m = -2 = v/u => v = -2u. Lens formula: 1/f = 1/v - 1/u => 1/20 = 1/(-2u) - 1/u = -3/(2u). Thus 2u = -60 => u = -30 cm. Distance is 30 cm.

Q7. What is the de Broglie wavelength of an electron accelerated through a potential difference of 100 V?
(A) 1.227 Å (B) 0.1227 Å (C) 12.27 Å (D) 0.01227 Å
Ans: (A) | Using standard shortcut lambda = 12.27 / sqrt(V) Å. Here V = 100 V, so sqrt(V) = 10. Therefore, lambda = 12.27 / 10 = 1.227 Å.

Q8. What is the molarity of a solution containing 4 grams of NaOH dissolved in 250 mL of solution? (Molar mass of NaOH = 40 g/mol)
(A) 0.1 M (B) 0.4 M (C) 0.2 M (D) 0.5 M
Ans: (B) | Moles of NaOH = 4 g / 40 g/mol = 0.1 mol. Volume of solution in liters = 250 / 1000 = 0.25 L. Molarity = Moles / Volume (L) = 0.1 / 0.25 = 0.4 M.

Q9. For a reaction to be spontaneous at all temperatures, what must be the signs of enthalpy change (delta H) and entropy change (delta S)?
(A) delta H > 0, delta S > 0 (B) delta H < 0, delta S < 0 (C) delta H < 0, delta S > 0 (D) delta H > 0, delta S < 0
Ans: (C) | Gibbs free energy equation is delta G = delta H - T delta S. For spontaneity, delta G must be negative. If delta H is negative (exothermic) and delta S is positive (disorder increases), delta G is always negative regardless of temperature T.

Q10. The half-life period of a first-order reaction is 60 minutes. What percentage of the reactant will remain after 240 minutes?
(A) 12.5% (B) 6.25% (C) 25% (D) 50%
Ans: (B) | Number of half-lives n = Total time / t_half = 240 / 60 = 4 half-lives. Fraction remaining = (1/2)^n = (1/2)^4 = 1/16 = 0.0625 or 6.25%.

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