

IAT 2022 Analysis Report in Physics

December 20, 2022



Previous analysis v/s IAT 2022

<i>Our prediction</i>	<i>IAT 2022 questions</i>
Units, Measurements and Vectors 1. One question comes every year from the entire chapter	()
Kinematics 1. Constant acceleration and projectile motion	Question based on projectile motion, another question based on velocity vector and acceleration vector Another question on relative motion
Newton's laws of motion and fictitious forces	()
Work, energy and power	<i>(Remark: atleast one question is expected in future)</i>
System of Particles and Rotational Motion 1. Atleast one question from the topics, angular momentum, centre of mass and torque equation	One question was asked on relative nature of angular momentum Another question on velocity of centre of mass
Gravitation	<i>(Remark: atleast one question is expected)</i>
Mechanical Properties of Solids	()
Mechanical Properties of Fluids 1. Viscosity and Surface Tension... not a lot of questions have been asked from here till now, but the trend may may not continue	Question based on Archimedes's principle of buoyancy
Thermal Properties of Matter	<i>(Remark: atleast one question is expected)</i>
Thermodynamics and KTG 1. Atleast two questions from topics, Thermal Expansion, Radiation and Laws of Thermodynamics, KTG and Calorimetry	Direct question on change in internal energy of a gas under adiabatic expansion
Waves and oscillations 1. Time Period calculation and superposition of SHM	Question based on time period of damped oscillations

Electric Charges and Fields, Electrostatic Potential and Capacitance 1. Atleast one question from the topics, fields and potential, Gauss's law	One graph question was asked about the variation of electric potential two concentric, charged spherical shells Another question was asked about the potential of a grounded conducting system <i>Yet another question on Coulomb's law!</i>
Current Electricity 1. Solving circuits	Direct question on solving a closed circuit and finding the charge in a capacitor between given nodes
Moving Charges and Magnetism	<i>(Remark: atleast one question is expected)</i>
Magnetism and Matter	()
Electromagnetic Induction 1. Inductance	Graph question on L-C-R circuit (damped oscillation in L-C-R circuit)
Ray Optics and Optical Instruments 1. Entire chapter	standard question based on reflection from a plane mirror (these types of questions were given in mock tests)
Wave Optics	()
Dual Nature of Radiation and Matter 1. Do not miss anything in Modern Physics	Graph question based on photoelectric effect (variation of photocurrent with change in intensity)
Atoms and Nuclei 1. Atleast two questions will be asked, so do not miss anything	One question was asked on energy released in fission reaction
Semiconductor Electronics	<i>(Remark: atleast one question is expected)</i>
Communication systems	()

Conclusion:

The majority of questions were posed based on an examination of previous year question papers. Along with this, there were specific types of questions that followed the same pattern as the mock tests.

The questions from certain chapters that had a high probability of coming but did not, might as well be asked in the coming years. One should not shift their focus from major chapters like:

1. Magnetism (mostly formula based questions are asked but ensure the practice)
2. Wave optics (the chapter is small, but the variety of questions is huge. The

questions asked may not be numerical, but conceptual and/or analytical)

3. Modern Physics (the whole Modern Physics is a bridge between scoring good and better than good as most questions are conceptual and/or numerical, so you may be required to memorize certain formula and constants).

The questions asked vary from numerical to conceptual to graph based. The sections that are most important are as follows:

- (a) DON'T miss anything, especially Snell's law, resolution power, intensity of radiation, de-Broglie waves, Wien's displacement law, radioactivity law and radioactive decay, atomic spectra of hydrogen atom, Bohr's model of H-atom, nature of EM waves.
4. Semiconductor Physics (a single question is probable to come based on truth table or semiconductor devices and/or logic gates)
5. Magnetism in matter (there may be a question on magnetization or hysteresis curve. Do not miss out the easy sections).
6. Newton's laws of motion (keep the concepts strong. The questions asked are mostly standard, but not asked quite often.)
7. Work, energy and power (there may be a question on work done by non-uniform forces, or based on work-energy theorem. Practice a few questions based on graph (this may involve more than one concepts, like work-energy theorem applied to rotational mechanics). The types of questions formed are numerous, so make sure to practice "unique" types of questions only).
8. Gravitation (A question may come on Kepler's laws or conservation laws, gravitational potential. Mostly, a question involving multiple concepts might come, so make sure to practice "unique" types of questions only)
9. Waves and oscillations (practice unique questions and systems involving block(s) and a spring, waves on a string, simple harmonic motion of pendulums).
10. Thermal properties of matter (practice questions on thermal expansion, Newton's law of cooling, etc.)
11. Thermodynamics and KTG (practice "unique" questions on PV-diagrams, types of thermodynamic processes, numerical based on laws of thermodynamics, thermal equilibrium, average kinetic energy of a gas).
12. Kinematics (practice "unique" questions based on angular momentum of a projectile, questions based on graph).

13. Current electricity and Alternating current (Revise concepts like current in the circuit, temperature dependence of resistance, current through resistor. Try solving "unique" problems, RC-circuits, charging and discharging of capacitors.)
14. Fluid mechanics (not a lot of questions have been asked lately, but there is a possibility of questions being asked from certain mixed topics like fluid in a tube and Archimedes's principle. Try not to skip all sections. Practice "unique" questions.)

Remember, in all of physics, it is the concept that matters. You can memorize all you want, but it is the understanding of the Physics that will take you to the solution. This is achievable only by rigorous practice of "unique" problems in Physics and thorough introspection of the concept.

