

**M. Sc. Physics (MSCP)**  
(Offered by CU Kerala and CU Rajasthan)

The Question paper will have common Part A and Subject specific Part B

---

**Part A:** It will be of 45 minutes duration and will have 35 Multiple Choice Questions (MCQs), with four options: only one correct. Each question carries one mark. There is no negative marking. Part A is intended to test the applicants; general awareness, reasoning, analytical skills and proficiency in English language.

---

**Part B:** will be subject specific, of 75 minutes duration and will have 65 MCQs with four options: only one correct. Each question carries one mark. There is no negative marking.

---

**Topics for Subject Specific Part B:**

**Mechanics-** Newtonian mechanics, Rigid body dynamics, Introductory Classical mechanics

**Electromagnetic theory** – Electrostatics, Current electricity, Chemical, thermal and Magnetic Effects of Current, Magnetism, Maxwell's equations, Electromagnetic waves

**Optics** – lenses, mirror, speed of light, interference, diffraction, polarization, optical fibers, laser

**Thermodynamics** – Laws of thermodynamics, Heat engines, Entropy, Thermodynamic potentials, Phase transitions

**Statistical mechanics** – Classical statistics, Fermi-Dirac and Bose – Einstein statistics

**Quantum mechanics** – Need of quantum physics, black body radiation, photoelectric effect, Wave – particle duality, de Broglie hypothesis, uncertainty principle, operator algebra, particle in a box problem.

**Atomic physics** – Atomic models – Rutherford, Bohr, Sommerfeld, Vector ; Quantum numbers, Spectral lines, Spectral notations, Stark effect, Zeeman effect, Atomic spectroscopic techniques, etc

**X-rays** – Generation of X-rays, Continuous and characteristic spectrum , Applications

**Nuclear Physics** – Constituents of nucleus, Atomic number, mass number, nuclear reactions, nuclear fission and fusion, applications

**Molecular Spectroscopy** – Introductory molecular spectroscopy – microwave, IR, Raman, ESR, NMR, Mossbauer (introductory level)

**Solid state physics** – lattice, unit cell, space group, point group, X-ray diffraction, band structure, metals, semiconductors, insulators, magnetic materials, super conductivity

**Electronics** – Electronic devices and circuits, OPAMPs, Digital electronics (introductory level)  
**Mathematical Physics** – Vectors, Matrices, differentiation, Integration, Differential equations

### Sample Questions ( PART A)

1. Find the odd one from the given alternatives  
(A) US Dollar (B) British Pounds (C) Indian Rupee (D) Japanese Yen
2. What is the next number in the series 4, 9, 16, 25, ....?  
(A) 32 (B) 36 (C) 41 (D) 50
3. Select the missing word.  
How do you distinguish ----- air type and string type musical instruments  
(A) from (B) between (C) about (D) upon

### Sample Questions ( PART B)

1. Melting point of ice \_\_\_\_\_.  
(A) increases with increase of pressure  
(B) decreases with increase of Pressure  
(C) is independent of Changes in Pressure  
(D) none of the above
2. Which is wrong about light emitting diodes?  
(A) They are used in remote controls for TV/VCR  
(B) We do not see the emitted light  
(C) They emit IR light  
(D) They emit UV light