

B.Sc.(F.S.) Semester - 4 (CBCS) Examination
March/April-2025 [NEW COURSE]
Physics (Core)

Time: 2:30 Hours**Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

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- Que-1 (A) Answer any two questions. (10)
1. Derive an equation of continuity.
 2. Explain Biot-Savart's law.
 3. Derive an equation of magnetic field above a straight wire.
- Que-1 (B) Answer any one question. (04)
1. Explain cyclotron motion.
 2. Explain steady current.
- Que-2 (A) Answer any two questions. (10)
1. Derive Mayer's formula.
 2. Derive an expression for work done during an adiabatic process.
 3. Explain heat engines and efficiency of heat engine.
- Que-2 (B) Answer any one question. (04)
1. Explain reversible process.
 2. Write a note on Carnot's ideal heat engine.
- Que-3 (A) Answer any two questions. (10)
1. Explain change of entropy in reversible process.
 2. State and Derive Stefan - Boltzmann law.
 3. Explain Wien's displacement and Wien's energy distribution law.
- Que-3 (B) Answer any one question. (04)
1. Write a note on T-S diagram.
 2. Explain Third law of thermodynamics.
- Que-4 (A) Answer any two questions. (10)
1. Explain principle, construction and working of LED.
 2. Explain principle, construction and working of solar cell.
 3. Explain Unijunction Transistor.
- Que-4 (B) Answer any one question. (04)
1. Write a note on Thermistor.
 2. Write advantages of FET.
- Que-5 (A) Answer any two questions. (10)
1. Explain OR gate and AND gate.
 2. Discuss NAND gate as a universal gate.
 3. State and prove De Morgan's theorems.
- Que-5 (B) Answer any one question. (04)
1. Write a note on NOT gate.
 2. Discuss advantages and disadvantages of digital electronics.
