

B.Sc. Semester - 6 (NEP-2020) Examination

March/April-2026

PHY: Electrodynamics & Solid-State Electronics (Major-14)

Time: 2:00 Hours

Marks: 50

Instructions:

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

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- Que.1 Answer the following questions (any two) (10)
- 1) Derive Gauss's theorem in integral and differential form.
 - 2) Explain Maxwell's modification of Ampere's law.
 - 3) Derive the expression of Poynting's theorem in differential version.
- Que.2 Answer the following questions (any two) (10)
- 1) Derive divergence and curl of B.
 - 2) Derive the boundary conditions: reflection and Transmission.
 - 3) Derive wave equation.
- Que.3 Answer the following questions (any two) (10)
- 1) Explain RC coupled transistor amplifier.
 - 2) Explain classification of power amplifier.
 - 3) Explain push-pull and complementary symmetry amplifier.
- Que.4 Answer the following questions (any two) (10)
- 1) Explain operation of differential amplifier.
 - 2) Explain common-mode and differential-mode signals.
 - 3) Explain Inverting Amplifier and Non-Inverting Amplifier in detail.
- Que.5 Answer the following questions (any five) (10)
- 1) Derive electric field of uniformly charged spherical shell.
 - 2) Write a note on motional emf.
 - 3) Compare Electrostatics and Magnetostatics.
 - 4) $f_1 = A \sin[b(z - vt)]$ and $f_2 = A e^{-b(z-vt)^2}$, prove both functions are valid or invalid wave function.
 - 5) Compare different types of coupling.
 - 6) Explain difference between voltage and power amplifier.
 - 7) Draw the basic circuit of differential amplifier.
 - 8) Explain comparator.
