D 140852 **(Pages : 2)** **Name.....**

Reg. No.....

FOURTH SEMESTER (CBCSS—U.G.) DEGREE EXAMINATION
APRIL 2026

Physics/Applied Physics

PHY4B04/APH4B04—ELECTRODYNAMICS—II

(2019 Syllabus)

Time : Two Hours Maximum : 60 Marks

The symbols used in this question paper have their usual meanings.

Section A (Short Answer Type)

Answer questions in two **or** *three sentences, each correct answer carries a maximum of* 2 *marks. All questions can be attended.*

1. Give Maxwell's modification of Ampere's law.
2. Define intensity of e.m.waves and how it is related to Poynting vector.
3. Define the r.m.s value of e.m.f and write how it is related to peak value of e.m.f.
4. What is an ideal constant voltage source ?
5. Write the boundary conditions for E, B, D and H, at a boundary between two different media.
6. Discuss the growth of current in a L-R circuit ?
7. Write down the characteristics of a dead beat moving coil galvanometer.
8. What you mean by Q-factor in a series resonant circuit.
9. Give the differential and integral form of Gauss' law in magnetostatics.
10. What is power factor ?
11. Write down the differential and integral forms of Faraday's law.
12. Compare series LCR resonant circuit and parallel LCR resonant circuit.

(Ceiling 20 marks)

Turn over

Section B (Paragraph / Problem Type)

All questions can be attended.

Answer questions in a paragraph of about **half a page to one page**, *each correct answer carries a maximum of* 5 *marks.*

13. Obtain the classical wave equation.

14. How can a voltage source be converted into equivalent current source and vice versa.

15. Find the potential inside and outside a spherical shell of radius R that carries a uniform surface charge. Set the reference point at infinity.

16. A capacitor of capacitance 0.5 μF and resistance 10 megaohm is charged to a potential difference of 10 V. Calculate the time constant and the maximum charge stored.

17. An LCR series circuit consists of an inductance 1 H, a capacitance 20 μF and a resistance 6Ω. Find the resonant frequency and Q-factor of the circuit.

18. Calculate the speed of electromagnetic waves in free space. The permeability and permittivity of free space are respectively $4\pi \times 10^{-7}$ H/m and 8.857×10^{-7} F/m.

19. State Lenz's law. Obtain the expression for energy stored in an inductor.

(Ceiling 30 marks)

Section C (Essay Type)

(*Essays - Answer in about* **two pages**, *any* **one** *question. Answer carries* 10 *marks*)

20. Describe with theory, the Anderson's method to determine self inductance of a coil.

21. Discuss the growth and decay of current through a circuit containing resistance and inductance. Plot the variations of current with various time constants. Find the expression for the time at which growing current and decay current are equal.

(1 × 10 = 10 mark)