23129052

QP CODE: 23129052

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS, OCTOBER 2023

Fifth Semester

CORE COURSE - PH5CRT05 - ELECTRICITY AND ELECTRODYNAMICS

Common for B.Sc Physics Model I, B.Sc Physics Model II Applied Electronics, B.Sc Physics Model II Computer Applications & B.Sc Physics Model III Electronic Equipment Maintenance

2017 Admission Onwards

E46EF5DA

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. What is skin effect?
2. What is a constant current source?
3. Define Seebeck effect.
4. Explain curl of a vector field?
5. Give some basic properties of electric charges.
6. Distinguish between Scalar and vector fields.
7. Prove that the tangential component of the electric field is continous across a boundary.
8. Explain why magnetic monopoles doesn't exist.
9. Distinguish between scalar and vector potentials.
10. Derive the Faraday's law in differential form.
11. State and explain Flemming's right hand rule.
12. What are monochromatic plain waves?

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. Calculate the average value and rms value of an alternating voltage for its half cycle.

14. An alternating voltage of 230V and frequency 50 Hz is applied to a 5H choke of resistance 100Ω. Find the power factor and power absorbed.

15. In a series LCR circuit R=10Ω, L=0.1H and C= 150μF and supply voltage is 200V with 50Hz. Find (i) the current (ii) power factor and (iii) voltage across the coil and condenser

16. Discuss growth current in an L - R circuit.

17. Show that for a point charge, curl of electric field is zero.

18. Two very long parallel non conducting sheets, both carrying equal positive charges of charge density 3.6×10^6 C/m^3 face each other. Find the electric fields at a point
a) Left to the sheets, b) Right to the sheets, c) Between the sheets

19. A long vertical wire carrying a current of 6 amperes is placed in the Earth's magnetic field. Find the position of the neutral point. Earth's horizontal component is BH = 4.3×10^{-5} web/m^2 .

20. Obtain an expression for magnetic field due to a solenoid.

21. State and explain Poynting's Theorem?

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. Develop the phase relation between voltage and current in a circuit which contain inductor only, capacitor only and resistor only.

23. A charged condenser discharges through an inductance and a resistance. Discuss the nature of the discharge with special reference to oscillatory discharge.

24. What is electric potential energy? Obtain an expression for the potential energy of continues charge distribution.

25. Discuss Maxwell's equations in vacuum, charge free region and matter.

(2×10=20)