

APRIL/MAY 2019

**BEL21 — ELECTROMAGNETISM AND AC
CIRCUITS**

Time : Three hours

Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. State Faradays law of induction.
2. What is mutual induction?
3. What is a RMS value of an alternating current?
4. What is Power factor?
5. State skin effect.
6. What is an AC Circuit?
7. What is a star connection?
8. Mention the advantages of AC over DC?
9. What is electromagnetism?
10. Give the Maxwell—Faraday Integral equation.



SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions.

11. (a) Derive an expression for coefficient of self induction.

Or

- (b) Explain the coefficient of self induction of a solenoid inductor.

12. (a) An electrical heating element which has an AC resistance of 40Ω is connected across a 220V AC single phase supply. Calculate the current drawn from the supply and the power consumed by the heating element.

Or

- (b) Explain the principle of wattless current.

13. (a) Explain the principle of high resistance by leakage.

Or

- (b) Derive an expression for growth and decay of current in a circuit having L and R

14. (a) Explain the principle of AC dynamos.

Or

- (b) Write note on an armature winding.

15. (a) Show that $\iint B \cdot ds = 0$.

Or

- (b) Show that $\nabla \cdot E = -\partial B / \partial t$.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain how mutual induction can be determined experimentally?
17. Explain the working of parallel resonant circuit.
18. Derive an expression for growth and decay of current in a charge having LCR - condition for discharge to be oscillatory.
19. Explain the compound wound dynamos and their characteristics.
20. Tabulate the integral and differential forms of Maxwell's equations.

