

BASIC ELECTRICAL ENGINEERING

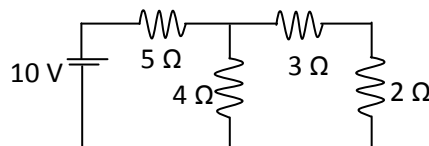
(Common to CSE, IT and CSS)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

- 1 (a) State and explain electro magnetism related laws.
(b) State and explain faraday's laws of electromagnetic education.
- 2 (a) Explain the types of active elements in detail.
(b) Find the current through $2\ \Omega$ using Thevenin's theorem.



- 3 (a) Make comparison between electric circuit and magnetic circuits.
(b) A steel ring of 25 cm mean diameter and of circular section 3 cm in diameter has an air gap of 1.5 mm length. It is wound uniformly with 700 term of wire carrying a current of 2 A. Calculate magneto motive force, flux density and reluctance.
- 4 Derive the expressions for RMS value and average value. When a circuit is excited by a sinusoidal voltage source $u = u_m \sin \omega t$. And also show that form factor of sinusoidal alternating current wave is 1.11.
- 5 (a) Explain the principle of operation of 1- ϕ transformers.
(b) A single phase transformer working at unity power factor has an efficiency of 90% at both $3/4^{\text{th}}$ load and full load of 750 W. Determine the efficiency at 50% of full load.
- 6 (a) Explain the principles of operation of DC generators.
(b) A four-pole DC shunt generator with lap connected armature supplies a load of 100 A at 200 V. The armature resistance is $0.1\ \Omega$ and the shunt field resistance is $80\ \Omega$. Find the total armature current and emf generated.
- 7 (a) Derive the emf equation of 3 - ϕ alternation.
(b) Calculate the synchronous speed of a 3 - phase 50 Hz, 4 - pole induction motor running at 1440 rpm.
- 8 Explain the principle and operation of moving iron instruments with neat diagram.
