

Code: 9A02306

B.Tech II Year I Semester (R09) Supplementary Examinations December 2015

BASIC ELECTRICAL ENGINEERING

(Common to CSE, IT & CSS)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

- 1 (a) Explain the division of current in the parallel branches.
(b) A circuit consists of three resistances of 12, 18 and 36 ohms respectively by joined in parallel and the combination is connected in series with a resistance of 12 ohms. The whole circuit is connected to 60 V supply. Calculate current in each branch, total current drawn and power dissipated in each resistor.
- 2 Derive the expression for the following:
(a) Three resistors are connected in parallel.
(b) Three inductors are connected in parallel.
(c) Three capacitors are connected in parallel.
- 3 (a) A current of 10 A flows in a circuit with 30 degree angle of lag when the applied voltage is 100 V. Find the impedance, reactance and resistance of the circuit.
(b) Derive the expression of true power and impedance in RLC series circuit.
- 4 A 5 kVA, 220/110 volts, 1-phase transformer has a maximum efficiency of 96.97 % at 0.8 p.f. lagging. It has a core loss of 50 watts and full load regulation at 0.8 p.f. lagging is 5 %. Find the efficiency and regulation at full load 0.9 p.f lagging.
- 5 (a) Explain the open circuit characteristics of DC shunt generator.
(b) A 6-pole dc generator has 600 wave wound conductors in its armature. If the flux per pole is 0.02 Wb and the generator runs at a speed of 1000 rpm. Calculate the induced emf.
- 6 The armature of a 8-pole, 8 circuit DC shunt motor takes 400 A at speed of 800 rpm. The flux per pole is 100 mWb. The number of armature turns is 1000. The torque lost in windage, friction and iron losses can be assumed as 3 %. Calculate:
(a) The torque developed by the armature.
(b) The shaft torque.
(c) Shaft power in kW.
- 7 Show that when a 3-phase supply is given to the stator winding of an induction motor, it produces a rotating magnetic field of constant magnitude and rotates at synchronous speed.
- 8 (a) Explain how the electrical measuring instruments are classified?
(b) A moving coil instrument has a resistance of 10 Ω and gives a full-scale deflection when carrying 50 mA. Show how it can be adopted to measure voltage up to 750 V.