

Code: 9A02301

**R09**

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

**ELECTRICAL ENGINEERING & ELECTRONICS ENGINEERING**

(Common to AE and ME)

Time: 3 hours

Max. Marks: 70

(Minimum of two questions from each part should be chosen for answering FIVE questions)

All questions carry equal marks

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**PART – A**

- 1 (a) Explain the types of elements in detail.  
(b) Determine the current delivered by the source by using star-delta transformation.
- 2 (a) Explain the operation of 3 – point starter with neat diagram.  
(b) Explain the applications of DC machines.
- 3 (a) Derive efficiency and regulation of transformer.  
(b) A 100 kVA, 1000/10000 V, 50 Hz single phase transformer has an iron loss of 110 W. The copper loss with 5 A in this high voltage winding is 400 W. Calculate the efficiencies at (i) 25%. (ii) 50% of normal load for power factor of (i) 1.0. (ii) 0.8. The output terminal voltage being maintained at 10,000 V.
- 4 Explain the principles of operation of induction motor with neat diagram.

**PART – B**

- 5 (a) With a neat diagram explain the operation of Bridge rectifier.  
(b) The reverse saturation current in a germanium diode is  $6 \mu A$ . Calculate the current flowing through the diode when the applied forward bias voltages are 0.2, 0.3 and 0.4 V at room temperatures.
- 6 (a) Explain the characteristics of SCR.  
(b) With a neat sketch explain the working of single stage CE amplifier.
- 7 (a) Explain the theory of Dielectric heating.  
(b) Describe the generation of ultrasonic waves using Piezo-electric effect.
- 8 (a) Explain the applications of CRO.  
(b) An electrostatic cathode ray tube has a final anode voltage of 600V. The deflection plates are 1.5 cm long and 0.8 cm apart. The screen is at a distance of 20 cm from the centre of plates. A voltage of 20 V is applied to the deflection plates. Calculate the following: (i) Velocity of electron on reaching the field. (ii) Acceleration due to deflection field. (iii) Deflection produced on the screen in cm.

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