

R09**Code: 9A14301**

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

ELECTRICAL ENGINEERING

(Mechatronics)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

- 1 (a) State and explain Ohm's law.
(b) Three resistors $R_1 = 5 \Omega$, $R_2 = 10 \Omega$, $R_3 = 15 \Omega$ are connected in series across a DC voltage source V . The total current through the circuit is 10 A. Find the voltages V_1 , V_2 , V_3 across R_1 , R_2 , R_3 and the total voltage V .
- 2 (a) Explain the types of active elements in detail.
(b) State and explain Maximum power transfer theorem by taking one example.
- 3 (a) Define and explain Peak factor, Average value, Frequency and Amplitude.
(b) Derive the expression for power dissipated by a pure inductor excited by a sinusoidal AC source.
- 4 How will you pre determine the efficiency and regulation of a 1-phase transformer? Explain with neat circuit diagram.
- 5 (a) Explain the principle and operation of DC generator.
(b) Derive the e.m.f equation of DC generator.
- 6 (a) Explain the losses that occur in DC machines.
(b) Explain the principle of operation of DC motor.
- 7 Explain the principle and operation of 3-phase induction motor by explaining rotating magnetic field.
- 8 (a) How the measuring instruments are classified? Explain in detail.
(b) Explain the principle and operation any one type of moving iron instrument with neat diagram.
