

Code No: 151AG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year I Semester Examinations, June - 2022

BASIC ELECTRICAL ENGINEERING

(Common to EEE, CSE, IT, CSIT, ITE, CE(SE), CSE(CS), CSE(DS), CSE(Networks), CSED)

Time: 3 Hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Explain in detail the passive elements and active elements.
b) By using Thevenin's theorem shown in figure 1, find the current in 6Ω resistor. [8+7]

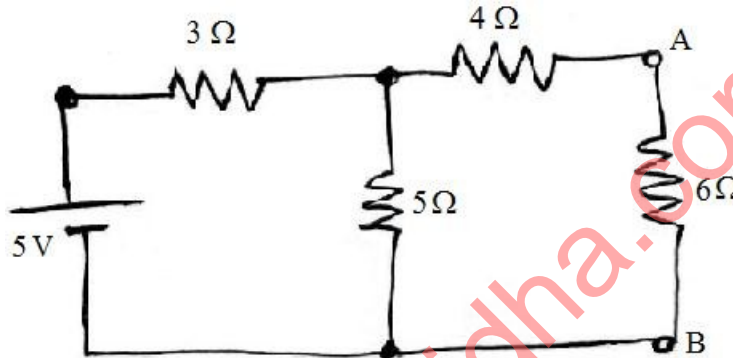


Figure 1

- 2.a) State Kirchhoff's voltage and current laws, Explain in detail.
b) By using superposition theorem, find the current flowing through $2\ \text{ohms}$ resistor. (Figure 2) [8+7]

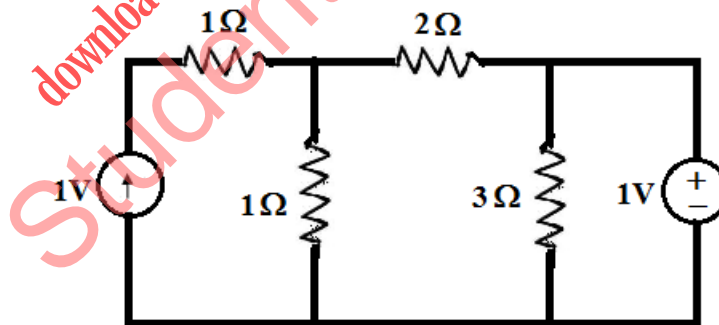


Figure 2

- 3.a) Explain the following terms of AC circuits
(i) rms value (ii) average value (iii) peak value
(iv) formfactor (v) phasor (vi) phase difference
b) Analyze the series RL circuit with a neat sketch and also draw the phasor diagram. [8+7]
- 4.a) Derive the relation between phase voltage and line voltage of a balanced three phase star connected system.
b) A circuit consisting of three branches, Z_2 is in parallel with Z_3 the combination is in series with Z_1 having the values $Z_1=5+j15$, $Z_2 =2.5+j5$ and $Z_3=2-j8$ connected across single phase, 100 V, 50 Hz supply. Find i) I_1 , I_2 and I_3 ii) V_1 and V_2 . [8+7]

- 5.a) The emf per turn of a 1- ϕ , 2200/220 V, 50 Hz transformer is approximately 12V. Calculate
- i) The number of primary and secondary turns, and
 - ii) The net cross-sectional area of core for a maximum flux density of 1.5 T?
- b) Explain the losses in a Transformer; also derive the maximum efficiency condition of a transformer. [8+7]
- 6.a) Explain the significance of torque-slip and characteristics of 3-phase induction motor.
- b) Why three phase induction motor not rotating at synchronous speed, explain. [8+7]
- 7.a) Explain the types of batteries and its important characteristics.
- b) Define earthing also explain the purpose of earthing. [7+8]
- 8.a) Explain the constructional details of synchronous generators.
- b) Why single phase induction motors are not self starting motors? Explain. [7+8]

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