R18

Code No: 151AG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year I Semester Examinations, July - 2021
BASIC ELECTRICAL ENGINEERING
(Common to EEE, CSE, IT, CSIT, ITE, CE(SE), CSE(CS), CSE(DS), CSE(Networks))

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) State and explain the Kirchhoff's laws.
b) By applying Kirchhoff's laws, determine the current through all the elements in the circuit as shown in the figure 1. [6+9]

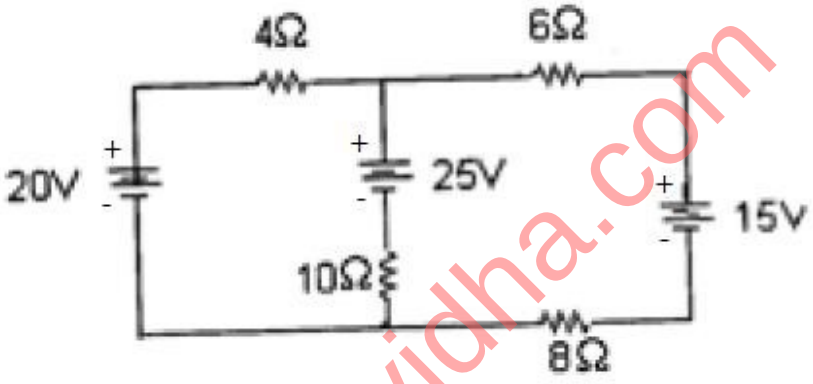

Figure: 1

2.a) State and explain Thevenin's theorem.
b) Using superposition theorem, determine the current through 3 ohm resistor shown in following figure 2 (All resistance are in ohms). [7+8]

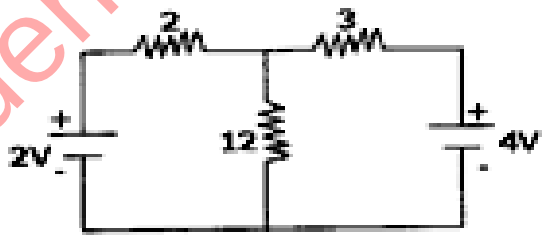

Figure: 2

3.a) Define the following terms:
i) Cycle ii) Amplitude
iii) R.M.S value and iv) Average value of an alternating quantity.
b) A coil having a resistance of 10 ohms and an inductance of 0.2H is connected in series with a 100×10^{-6} F capacitor across a 230V, 50Hz, determine
i) The active and reactive components of the current and power.
ii) The voltage across the coil, Draw the phasor diagram. [6+9]

4.a) What are the advantages of polyphase system?
b) Determine the line and phase current of the load, when a delta connected balanced load with an impedance of (25+j15) ohms is connected to 230V, three phase balanced supply in positive sequence. [6+9]

5.a) Develop the equivalent circuit of a single phase transformer.

b) A 220/440 V single phase transformer has 1000 turns on primary. The maximum flux density in the core is 1.2 Wb/m^2. Calculate the number of turns on secondary, area of cross section and maximum flux in the core. [6+9]

6.a) Explain the different 3-phase transformers connections with neat diagram.

b) The core of a 100 kVA, 11000/550V, 50 Hz, single phase core type transformer has a cross section of 20cm × 20 cm. Determine i) the number of H.V. and L.V turns per phase and ii) the e.m.f. per turn, if the maximum core density is 1.3 tesla. [8+7]

7.a) Explain the speed control of 3-phase induction motor.

b) A 6-pole, 100 HP, 3-phase, 440-V, 50Hz induction motor has a slip of 5% on full load. Calculate the speed of the motor? [9+6]

8.a) Describe the miniature circuit breaker with neat diagrams.

b) Explain different types of wires used in electrical wiring. [7+8]

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