Code: 15A99301 **R15**

B.Tech II Year I Semester (R15) Regular Examinations November/December 2016

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

(Common to CSE & IT)

Time: 3 hours Max. Marks: 70

Answer all the questions

PART - A

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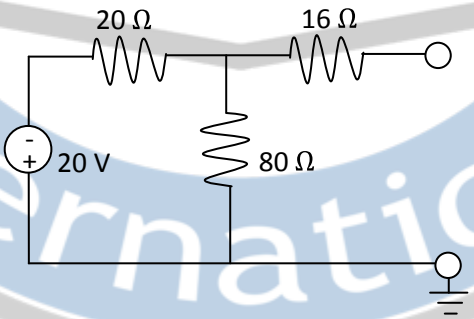
UNIT – I

1 (a) Write equations for RMS value, average value, form factor and peak factor.

(b) Three resistances of values $2\ \Omega, 3\ \Omega$ and $5\ \Omega$ are connected in series across 20 V, D.C supply. Calculate: (i) Equivalent resistance of the circuit. (ii) The total current of the circuit. (iii) The voltage drop across each resistor. (iv) The power dissipated in each resistor.

OR

2 Determine the Thevenin's equivalent circuit for the network shown in the figure below.



UNIT – II

3 (a) Derive the EMF equation of a DC generator.

(b) A 440 V shunt motor has armature resistance of 0.8Ω and field resistance of 200Ω. Determine the back EMF when giving an output of 7.46 kW at 85% efficiency.

OR

4 Derive the torque expression of a DC motor.

UNIT –III

5 Derive the expression for induced EMF in a transformer in terms of frequency, maximum value of flux and number of turns in the windings.

OR

6 Explain the principle of operation of 3-phase squirrel cage induction motor.

PART – B

UNIT – I

7 (a) What do you understand by N-type and P-type semiconductors? Illustrate with an example.

(b) Discuss about the volt-ampere characteristics of PN junction diode with necessary diagram.

OR

8 (a) Explain the working of full wave bridge rectifier with diagram.

(b) Describe about the volt-ampere characteristics of Zener diode with diagram.

Contd. in page 2

UNIT – II

9 Describe about operation of NPN transistor and its I/O characteristics in terms of CE configuration with necessary diagram.

OR

10 (a) Illustrate with diagram and explain about the construction, working principle and operation of JFET.

(b) Give the comparison of JFET and MOSFET.

UNIT –III

11 Explain the operation of RC phase shift oscillator circuit and express the condition for sustained oscillation.

OR

12 List out the important characteristics of an ideal op-amp. Discuss about the construction and working of inverting and non-inverting amplifiers.

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