

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

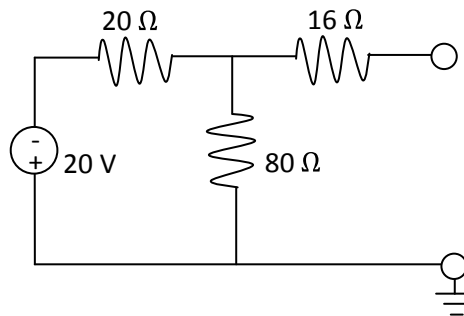
PART - A

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 $0.8\ \Omega$ and field resistance of $200\ \Omega$. 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.

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.
