Code No: 113BR

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, November - 2015
BASIC ELECTRICAL ENGINEERING
(Common to CSE, IT)

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

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

PART- A **(25 Marks)**

1.a) The voltage across 5Ω resistor is 10 volts, Find the current and power dissipated in that resistor? [2M]
b) Give the statement of Thevenin's theorem. [3M]
c) Define form factor and peak factor. [2M]
d) Discuss the significance of j-operator. [3M]
e) Write the relation among primary and secondary voltages, currents and winding turns. [2M]
f) Write the properties of ideal transformer. [3M]
g) What is the expression for torque developed in a DC motor? [2M]
h) Define slip and synchronous speed. [3M]
i) What is the role of damping torque in measuring instruments? [2M]
j) Categorize the commonly used ammeters and voltmeters. [3M]

PART-B **(50 Marks)**

2.a) Derive the relationship between Star to delta transformation.
b) State and explain Kirchhoff's laws with an example. [5+5]

OR

3.a) Find the current flowing through 2Ω resistor using superposition theorem (figure 1).

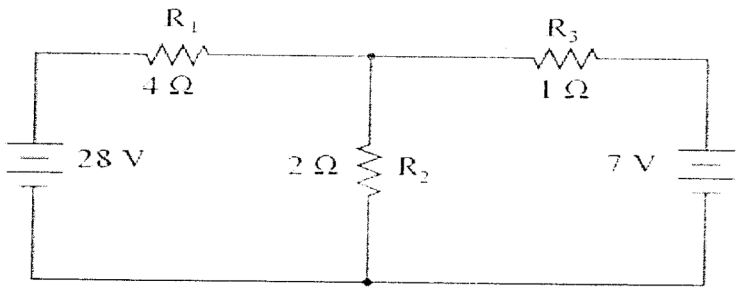

Figure: 1

b) Explain passive and active elements in detail. [6+4]

4.a) Find the R.M.S value for the following waveform (Figure 2).

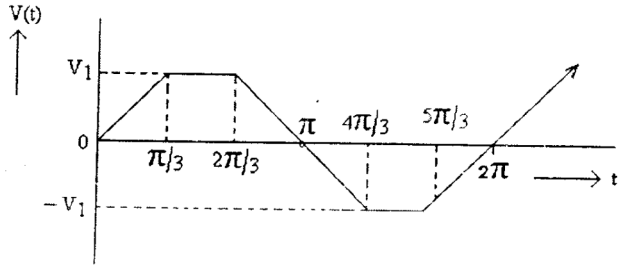

Figure: 2

b) Find the current in a series R-C circuit when excited by $v(t) = V_m \sin(wt)$. [6+4]

OR

5.a) Explain the following with an example:
i) addition and subtraction of phasors
ii) multiplication and division of phasors.

b) Find the impedance of series R-L-C circuit with R=100Ω, X_L=50Ω and X_C=20Ω. [6+4]

6.a) Explain the working principle of single-phase transformer.

b) What are the tests to be conducted on a single phase transformer to find efficiency and regulation of a transformer? [5+5]

OR

7.a) Explain various losses in a single phase transformer.

b) Enumerate constructional features of single-phase transformer. [5+5]

8.a) Draw and explain slip-torque characteristics of 3-phase induction motor.

b) Derive the emf equation of DC Generator. [5+5]

OR

9.a) Explain the classification of DC motors and their applications.

b) Discuss the principle of operation 3-phase induction motor. [5+5]

10. With a neat sketch, explain the construction and operation of PMMC instrument? State their advantages and disadvantages. [10]

OR

11. Explain the principle of operation of M.I instruments. State their advantages and disadvantages. [10]

---ooOoo---