Code No: 123AP

R15

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, March - 2017
ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to AME, CE, CEE, ME, MSNT, PTM)

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

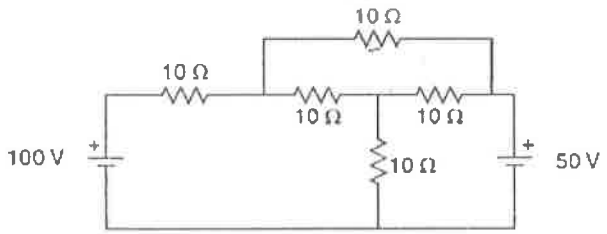
(25 Marks)

1.a) Define: i) Inductance and ii) Capacitance. [2]
b) Compare Moving coil with Moving iron instruments. [3]
c) Explain what happens when a dc motor is connected across an ac supply? [2]
d) Why starter is necessary for a dc motor? Give the relevant expressions. [3]
e) Why the transformer rating is expressed in KVA? [2]
f) State various applications of induction motor. [3]
g) Define holding current and latching current of SCR. [2]
h) The collector current is 2.9mA in a certain transistor. If the base current is 100μA, what is the value of α? [3]
i) Mention the names of the voltage and the electrode system that controls the brightness of the image of the names of the display on the screen of the CRO. [2]
j) State a few applications of a CRO in electronic circuits in laboratory. [3]

PART-B

(50 Marks)

2.a) Explain the constructional features of PMMC instrument with a neat sketch.
b) Find the currents flowing in all the resistances in the figure. [5+5]



OR

3.a) Three equal resistors each of R ohms are connected in delta. Derive the value of resistors in the equivalent star.
b) What are the essential requirements of measuring instruments? [5+5]

4.a) Derive the expression of induced emf of dc generator.
b) A 25-kW, 250V, DC shunt generator has armature and field resistances of 0.06 ohms and 100 ohms respectively. Determine the total armature power developed when working as a motor taking 25kW input. [5+5]

OR

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5.a) Give the classification of DC generators with their connection diagrams. Write their relevant voltage equations

b) State the applications of the following DC motors:
i) series ii) shunt. [8+2]

6.a) "Transformer is a constant flux machine". Justify the statement.

b) Sketch the necessary plots for determination of the regulation of alternator by synchronous impedance method and give necessary expressions. [6+4]

OR

7.a) Discuss the principle of operation of induction motor with neat sketch.

b) A single phase transformer has 50 primary and 1000 secondary turns. Net-cross sectional area of the core is 500 cm^2. If the primary winding is connected to 50 Hz supply at 400 V, Calculate the value of maximum flux density on core and the emf induced in the secondary. [6+4]

8.a) Discuss how a transistor can be used as current amplifier.

b) A diode operating at 300 K has $V_{(forward)}$ of 0.4V across it when the current it is 10mA and 0.42V when the current is twice as large. What values of 'I_o' and 'η' allow the diode to be modeled by the diode equation? [6+4]

OR

9.a) Explain how SCR is turned on by its gate?

b) Sketch the characteristic of PN junction. Explain the dependence of this characteristic on junction temperature. [5+5]

10.a) Write a short note on Electrostatic and Magnetic deflections in CRO.

b) Mention the importance of specification of electrostatic deflection sensitivity during process of purchase of a CRO. [6+4]

OR

11. Describe a method of measuring AC voltage using a CRO. [10]

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