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(Revision 2010)

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THIRD SEMESTER DIPLOMA EXAMINATION IN ELECTRICAL AND ELECTRONICS ENGINEERING - March 2013

DC MACHINES

Maximum Marks : 100 Time : 3 Hrs

PART– A

(Maximum marks: 10)

I. Answer the following questions in one or two sentences. Each question carries two marks Marks

1 Define commutator
2 State the functions of Yoke.
3 Which material is commonly used as Brushes in DC machines.
4 What is magnetic Neutral axis.
5 Write the voltage equation of a shunt motor. [5x2 =10]

PART - B

(maximum marks : 30)

II Answer any five of the following questions. Each question carries 6 marks

1 List the properties of carbon
2 Classify material based on conductivity and give two examples for each.
3 Distinguish between terminal voltage and induced e.m.f.
4 What is the necessity of starters used in motor?
5 Explain the methods for improving commutation
6 Give two speed control methods used in DC shunt motor
7 Explain two speed control methods used in a DC series motor [5x6=30]

PART - C

(maximum marks : 60)

(Answer one full question from each unit. Each question carries 15 marks)

UNIT I

III a Draw and explain Hysteresis loop of a magnetic material [8]
b How magnetic materials are classified. Explain [7]

OR

IV a Write short notes on (1) CRGO core (2) Soft ferrites [8]
b Draw the B.H curves for Ferro magnetic material and explain [7]

UNIT II

V a Derive the e.m.f equation of a DC generator [7]
b Give the connection diagram of DC generators according to excitation [8]

OR

VI a Give the constructional details of DC generator [7]
b A shunt Generator gives 450A at 230V and the resistance of the shunt field and armature are 50Ω and 0.03 Ω respectively. Calculate the generated e.m.f [8]

UNIT III

VII a Explain the effect of Armature reaction [7]
b State the conditions for voltage build-up of a shunt Generator [8]

OR

VIII a Draw and explain the steps for finding critical resistance from O.C.C [7]
b What is parallel operation of DC generators? Why it is needed? [8]

UNIT IV

IX a Explain the working of DC motors [7]
b Explain 3 point starter, with sketch [8]

OR

X a State the order of losses in a DC machine as motor [7]
b Derive the condition for maximum efficiency of a DC motor. [8]

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