TED (10) – 3054 Reg. No. .....

(REVISION —2010) Signature .....

THIRD SEMESTER DIPLOMA EXAMINATION IN ELECTRICAL AND ELECTRONICS ENGINEERING — MARCH, 2016

DC MACHINES

[*Time* : 3 hours

(Maximum marks : 100)

PART—A

(Maximum marks : 10)

Marks

I Answer the following questions in one or two sentences. Each question carries 2 marks.

1. State the functions of Yoke.
2. List two applications of compound generator.
3. Write the voltage equation of a DC shunt motor.
4. What is short pitched coil ?
5. List two advantages of DC series motor. (5×2 = 10)

PART— B

(Maximum marks : 30)

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

1. List any six properties of copper.
2. Differentiate the properties of soft and hard magnetic materials.
3. What are the advantages of connecting DC generators in parallel ?
4. Write the important points regarding lap winding.
5. What is the necessity of starters used in DC motor and name different types of starters ?
6. Derive torque equation of a DC motor.
7. Write the application of DC motors.

(5×6 = 30)

Marks

PART— C

(Maximum marks : 60)

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

UNIT – I

III (a) List the properties of carbon. 8

(b) Briefly explain the effects of various factors on insulation resistance. 7

OR

IV (a) Explain the classification of the magnetic materials. 8

(b) Explain PVC and its characteristics. 7

UNIT – II

V (a) Write the equation for generated emf and current of a separately excited and shunt generator with neat diagram. 8

(b) A short shunt compound generator delivers a load current of 25A at 240V has armature, series field and shunt field resistance of 0.03Ω, 0.02Ω and 220Ω respectively. Calculate the induced e.m.f. and the armature current. Allow 1V per brush for contact drop. 7

OR

VI (a) Draw the constructions of a DC generator and mark the different parts. 8

(b) A 4 pole generator having wave wound armature winding has 102 slots. Each slot containing 10 conductors. What will be the voltage generated in the machine when driven at 1000 rpm, assuming the flux per pole to be 6 milliweber ? 7

UNIT – III

VII (a) Explain commutation in DC generator. 8

(b) Draw the characteristics of a DC series generator. 7

OR

VIII (a) Explain armature reaction. 8

(b) What is the necessity of compensating winding in DC generator ? 7

UNIT – IV

IX (a) What are the different methods of speed control of DC series motor ? 8

(b) Draw the different characteristics of DC series motor. 7

OR

X (a) Explain swinburn's test. 8

(b) Write any seven advantages of PMDC motor. 7