TED (10) – 3054 Reg. No. .....

(REVISION —2010) Signature .....

THIRD SEMESTER DIPLOMA EXAMINATION IN ELECTRICAL AND ELECTRONICS ENGINEERING — OCTOBER, 2015

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. What is coil span ?
2. State the functions of yoke.
3. State generator rule.
4. Define torque.
5. Write the voltage equation of a DC shunt motor.

(5x2=10)

PART— B

(Maximum marks : 30)

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

1. Explain the constructional details of a pole.
2. Compare Copper and Aluminium.
3. Explain critical speed and critical resistance.
4. State the importance of back emf.
5. Give the speed control methods of a dc series motor.
6. Explain the necessity of starters in motors.
7. Mention the losses on a dc machine and explain.

(5x6=30)

Marks

PART— C

(Maximum marks : 60)

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

UNIT – I

III (a) Draw and explain Hysteresis loop. 8

(b) State the properties and application of Ferro magnetic material. 7

OR

IV (a) State the factors affecting Iron loss. 8

(b) What is meant by CRGO Core. State its advantages. 7

UNIT – II

V (a) Derive the emf equation of a dc generator. 8

(b) A shunt generator delivers 450A at 230V and the resistance of the shunt field and armature are 50Ω and 0.03Ω respectively. Calculate the generated emf. 7

OR

VI (a) Classify DC generators based on excitation with connection diagram. 8

(b) A 4-pole dc generator is delivering 20A to a load of 10Ω. If the armature resistance is 0.5Ω and shunt field resistance is 50Ω, calculate the induced emf and efficiency of the machine allow 1 volt drop per brush. 7

UNIT – III

VII (a) State the procedure for parallel operation of DC generators. 8

(b) Explain the effect of armature reaction. 7

OR

VIII (a) State the conditions for voltage build up of a DC shunt generator. 8

(b) Explain the methods of improving commutation. 7

UNIT – IV

IX (a) Explain the working of a DC motor. 8

(b) Derive the condition for maximum efficiency of a DC motor. 7

OR

X (a) Explain the speed control of a DC shunt motor. 8

(b) Write the working of permanent magnet DC motor. 7