DCm/c. 1

MODEL QUESTION PAPER

TED (15) - 4031
(RE VISION — 2015)

Reg. No......................................
Signature....................................

FOURTH SEMESTER DIPLOMA EXAMINAHON IN ELECTRICAL AND ELECTRONICS
ENGINEERING -   APRIL 2017

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. List the two main classifications of DC generator in the means of field excited.

2. Write any two applications of DC compound generator.

3. Write two speed control methods of a DC series motor.

4. Write the mechanical characteristics of a DC motor.

5. Write any two applications of permanent magnet DC motor.

PA RT—B
(Maximum marks: 30)

II   Answer any five questions. Each question carries 6 marks.

1. Describe the working principle of DC generator.

2. List the important points regarding simplex wave winding.

3. Illustrate the internal characteristics of shunt generator with relevant circuit and model curves.

4. State the methods of improving commutation.

5. Explain working principle of DC motor.

6. Illustrate the necessity of starters.

7. Describe the direct loading method to determine the efficiency of DC shunt motor.

PART—C

(Answer one full question from each module. Each question carries 15 marks.)
(Maximum marks: 60)

Module - I

III a). Illustrate constructional details of DC generator. (8)

b). Draw a developed diagram of a simple 2-layer wave-winding for a 4-pole DC generator with 30 armature conductors. And determine the brushes. (7)

OR

IV a). Describe the working of single loop DC generator with relevant sketch and wave form. (8)

b). An 8-pole dc shunt generator with 778 wave-connected armature conductors and running at 500 rpm. Supplies a load of 12.5 Ohms resistance at terminal voltage of 250 V. The armature resistance is 0.24 Ohms and the field resistance is 250 Ohms. Find the armature current, the induced emf. And flux per pole. (7)

Module - II

V a). State and explain armature reaction. (8)

b). Define the procedure for finding critical field resistance of a shunt generator. (7)

OR

VI a). Illustrate the internal and external characteristics of series generator (8)

b). Explain the parallel operation and load sharing of generators. (7)

Module - III

VII a). Explain constructional details of DC motor. (8)

b). Derive torque equation of DC motor. (7)

OR

VIII a). A 220V dc shunt motor runs at 500 rpm when the armature current is 50A. Calculate the speed if the torque is doubled. Given that Ra = 0.2 Ohm. (8)

b). Explain factors affecting the speed of control of DC motor (7)

Module - IV

IX a). Illustrate the mechanical characteristics of series motor. (8)

b). State the advantages and disadvantages of Swinburne's test. (7)

OR

X a). Illustrate the performance characteristics of compound motor. (8)

b). Describe the direct loading method to determine the efficiency of DC shunt motor. (7)