TED (10) -3054
(Revision -2010)

A21-05009

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE – APRIL -2021.

DC MACHINES

(Maximum Marks : 100) [Time : 3 hours]

PART–A

(Maximum marks: 10) Marks

I. Answer **all** questions in one or two sentences. Each question carries 2 marks.

1. Explain residual magnetism.
2. What is the purpose of commutator in a DC Generator?
3. What is a compensating winding?
4. Explain the voltage equation of a DC Motor.
5. What are the losses in a DC Machine? (5x2=10)

PART - B

(Maximum Marks : 30)

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

1. Explain eddy current loss and method of reducing it.
2. Explain the term coercive force and retentivity.
3. Derive the emf equation of a DC Generator.
4. Differentiate Lap and Wave winding.
5. What are the effects of armature reaction? Explain.
6. Define communication. Explain the method for improving it.
7. Explain different speed control of DC Motor? (5x6 =30)

PART - C

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

UNIT I

III (a) Explain the properties of ferromagnetic materials. (7)

(b) Differentiate soft and hard magnetic materials. Give examples on both. (8)

OR

IV (a) Draw and explain B-H curve. (8)

(b) Explain the properties of Carbon. (7)

UNIT- II

V (a) List the essential parts of a DC Generator. Write the purpose of each part. (7)

(b) Explain the classification of DC Generators according to excitation with fig. (8)

OR

VI (a) A four pole generator, having wave wound armature winding has 51 slots, each slot containing 20 conductors. What will be the voltage generated in the machine when driven at 1500 rpm, assuming the flux per pole to be 7 m Wb. (7)

(b) Explain back pitch, front pitch, resultant pitch, and commutator pitch. (8)

UNIT- III

VII (a) Explain Equaliser connection of a DC Generator. (7)

(b) Explain the method of finding critical field resistance of a DC Generator. (8)

OR

VIII (a) Deduce an expression for demagnetizing and cross magnetizing AT/Pole. (8)

(b) Explain the procedure of paralleling of DC Generators. (7)

UNIT – IV

IX (a) Deduce an expression for the armature torque of a DC Motor. (8)

(b) Draw a 3 point starter and identify the various parts. (7)

OR

X (a) Write four applications of shunt and series Motors, with reason. (8)

(b) Explain working principle of a permanent magnet DC Motor with fig. (7)

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