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C16-EE-302

6238

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/APRIL—2021

DEEE - THIRD SEMESTER EXAMINATION

DC MACHINES AND MEASURING INSTRUMENTS

Time : 3 hours ]

[ Total Marks : 80

PART—A

3×10=30

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. List out the materials used for any six parts of a DC Generator.
2. State the following terms :
  - (a) critical field resistance
  - (b) critical speed of a DC generator
3. Define commutation of a DC Generator and state the methods of improving it.
4. State Fleming's Left Hand Rule and state its application.
5. State any three factors which control the speed of a DC Motor.
6. State the advantages and disadvantages of Armature Voltage Control method of a DC Shunt Motor.

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7. Define the following terms :
  - (a) accuracy
  - (b) precision
  - (c) error related to measuring instruments
8. State the precautions to be taken while working with Current Transformer.
9. State the advantages and disadvantages of Dynamometer type measuring instrument.
10. List any three analog type electronic measuring instruments.

**PART—B**

**Instructions :** (1) Answer **any five** questions.  
(2) Each question carries **ten** marks.  
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. Derive E.M.F. equation of a DC Generator in terms of flux, conductors, speed, poles and parallel paths. 10
12. Explain Armature Reaction of a DC Generator with legible sketches. 10
13. Explain the working of a DC Motor with a legible sketch. 10
14. (a) A 6-pole, 500 V, wave-wound DC Shunt Motor has 1200 armature conductors. The flux per pole is 20 mWb. The resistance of armature and shunt field are 0.5 ohm and 250 ohm respectively. The stray losses are 900 W. If the motor takes a current of 20 A, find (i) speed, (ii) shaft torque and (iii) efficiency. 5  
(b) Explain the working of 4 point starter with a legible sketch. 5
15. Explain the method of conducting brake test on a DC Shunt Motor with a legible sketch. 10

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16. Explain the working of Permanent Magnet Moving Coil measuring instrument with a legible sketch. 10
17. (a) Explain the construction of Weston Synchroscope with a legible sketch. 5
- (b) Explain the working of Rectifier type Voltmeter with a legible sketch. 5
18. Explain the working of Digital Multimeter with a block diagram. 10

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