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C16-EE-302

6238

BOARD DIPLOMA EXAMINATION, (C-16)

OCT/NOV—2018

DEEE—THIRD SEMESTER EXAMINATION

DC MACHINES AND MEASURING INSTRUMENTS

Time : 3 hours ]

[ Total Marks : 80

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**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. A shunt generator delivers 500 A at 230 V and the resistance of the shunt field and armature are 50 and 0.03 respectively. Calculate the generated emf.
2. Define the terms pole pitch, back pitch and front pitch in DC machine windings.
3. State the applications of DC shunt, series and compound generators.
4. Classify DC motors based on excitation.
5. What is the necessity of starter for a DC motor?

6. List different <sup>\*</sup> methods of speed control of DC series motor.
7. State the precautions to be taken while using CT.
8. List the errors commonly occurring in moving coil instruments.
9. Compare moving coil and moving iron instruments in any three aspects.
10. State the advantages and disadvantages of digital instruments.

**PART—B**

10×5=50

**Instructions :** (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

(3) The answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. (a) A 4-pole DC generator having wave wound armature conductors has 51 slots with each slot containing 20 conductors. Find the emf generated when the machine is driven at 1500 rpm assuming flux per pole to be 7.0 mWb.  
(b) Explain the significance of back EMF in DC motor.
12. Derive the E.M.F equation of a DC generator.
13. A 4-pole, 500-volt wave wound DC shunt motor has 720 conductors on its armature. The full load armature current is 60 A and the flux per pole is 0.03 weber. The armature resistance is 1.2 and the brush contact drop is 1 volt/brush. Calculate the full load speed of the motor.
14. Explain the working of 3-point starter with a neat sketch.
15. (a) Explain any one method of speed control of DC series motor.  
(b) State the necessary conditions for parallel operation of DC generators.

- 16.** Explain the <sup>\*</sup> construction and working of permanent magnet moving coil instrument with a neat sketch.
- 17.** (a) List any two errors and their remedies in single-phase energy meter.  
(b) State any five specifications of digital multimeter.
- 18.** Explain the working of digital multimeter with a neat sketch.

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