

CT Inst. of En

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (EE/EEE) (Sem.-4th)
EMEC AND DC MACHINES
 Subject Code : EE-202
 Paper ID : [A0407]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A**I. Write briefly :**

- a) Why there is need of starters for DC motors?
- b) List the main parts of DC machine. What is importance of a commutator?
- c) How can we obtain the internal characteristics from external characteristics of a DC shunt generator?
- d) State and briefly discuss the principle of electromechanical energy conversion with one simple example.
- e) Define winding factors and benefits of short pitched coils.
- f) What is the function of compensation winding in a DC machine?
- g) If DC motor fails to start when switched on. What could be the possible reasons and remedies?
- h) When load is removed, _____ motor will run at the highest speed.
- i) Show the energy in magnetic field is expressed as $E = \frac{1}{2} \mu H^2 = \beta^2 / 2\mu$
- j) Draw schematic diagram of a metadyne generator which behaves as a constant current generator.

SECTION-B

2. What is commutations? What causes sparking on _____ and how can it be avoided? Explain.
3. Discuss flow of energy in electromechanical device _____ confirm the generating and motoring principles.
4. Classify DC generators. Show VI character _____ DC generators.
5. Explain why the speed torque characteristic of _____ linear in the high torque region.
6. A 60 KW, 250 V shunt motor takes 16A when run _____ resistance of the armature and field are 0.2Ω and _____ When hot
 - a) Estimate the efficiency of the motor when taking _____
 - b) Also estimate the efficiency if working as a gen _____ load current of 152A at 250 V.

SECTION-C

7. Explain the various characteristics of DC generator _____
8. A 4 pole DC shunt motor working 250 V takes _____ rotating at 1000 rpm. What will be backup speed _____ drop if motor takes 51A at a certain load? Arm _____ resistance are 0.2 W and 250 W respectively
 - a) What is meant by cross field machine? Explain _____ help of a diagram.
 - b) What is an amplidyne? Draw its connection d _____ working.

