Reg. No. : .....

Name : .....

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E – 2469

Eighth Semester B.Tech. Degree Examination, May 2018
(2013 Scheme)
13.801 : ELECTRICAL DRIVES AND CONTROL (T) EC

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions, **each** question carries **2** marks.

1. A DC machine fails to excite. List the various causes for this phenomenon.
2. List the different losses in DC machine. Which of these are constant losses ?
3. Explain why induction motor cannot run at synchronous speed.
4. Compare power MOSFET with IGBT.
5. What is meant by breakdown voltage in BJT ?
6. Define chopper. Give its applications.
7. What is meant by controlled rectifier ? List the applications of controlled rectifier.
8. What is meant by phase-controlled principle ?
9. Mention the purpose of feedback diodes in inverter.
10. List the different methods of voltage control in the inverters. **(10×2=20 Marks)**

PART – B

Answer **one full** question from **each** Module, **each** Module carries **20** marks.

Module – I

11. a) Explain the external and internal characteristics of short-shunt DC compound generator. **10**

    b) A short shunt compound generator delivers a load current of 5A at 230 V and the resistances of armature, series and shunt fields are 0.04 Ω, 0.01 Ω and 500 Ω respectively. Calculate the generated emf and armature current. Allow 1.0 V per brush for contact drop. **10**

OR

12. a) A 4-pole, 3-phase, 415 V, 50 Hz, 1HP induction motor has frequency in rotor of 2 Hz at full load. At what speed the motor is running and what is its slip. **6**

    b) Explain the speed torque characteristics of DC shunt motor, DC series motor; differentially compound long shunt DC motor and cumulative compound long shunt DC motors. **14**

Module – II

13. a) Draw and discuss switching characteristics of power MOSFET. **10**

    b) Draw and discuss switching characteristics of power BJT. **10**

OR

14. a) Explain the principle of operation of step down chopper. Derive the expressions of output voltages. **10**

    b) Explain the principle of operation of four-quadrant DC chopper with circuit diagram and draw its VI characteristics. **10**

Module – III

15. Describe the operation of a single-phase half-wave controlled bridge rectifier with RL load. Draw the waveforms of output voltage, thyristor voltage and output current. Also derive the output current expression. **20**

OR

16. Explain the circulating current mode of working of a single-phase dual converter. List the advantages and drawbacks of circulating mode of operation. **20**

Module – IV

17. a) Explain the sinusoidal-pulse width modulation technique of varying the magnitude of output voltage in a single-phase inverter. **10**

    b) Explain the multiple-pulse width modulation technique of varying the magnitude of output voltage in a single-phase inverter. **10**

OR

18. a) Explain with neat sketch the operation of online and offline UPS. **10**

    b) Explain v/f speed control operation of three phase induction motor drive. **10**
