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Reg. No. :

Name :

Eighth Semester B.Tech Degree Examination, February 2021

(2013 Scheme)

13.801 : ELECTRICAL DRIVES AND CONTROL (T)

Time : 3 Hours

Max. Marks : 100

PART - A

Answer **all** questions. Each question carries **2** marks

1. Explain the principle of operation of DC generator
2. Explain why dc series motor is used in starting of high inertia loads.
3. Explain why single phase induction motor is not self starting.
4. Explain the principle of operation of power MOSFET.
5. Explain the main difference between MOSFET and BJT.
6. Write down the expression of average output voltage for half wave rectifier connected to resistive load.
7. Explain the term holding current latching current in SCR.
8. Explain the significance of freewheeling diode.
9. Explain Multipulse modulation technique.
10. List the merits and demerits of online and offline ups.

P.T.O.



PART – B

Answer **any one** full questions from each Module. Each question carries **20** marks.

Module – I

11. (a) Explain the working principle of a single phase induction motor. (10)
- (b) Explain the electrical and mechanical characteristics of DC shunt and series motor. (10)

OR

12. A 220V, 1000 rpm, 20A dc series motor is driving at rated conditions a load whose torque is proportional to speed squared. The combined resistance of armature and field is 1.2Ω . Calculate motor terminal voltage and current for a speed of 900rpm. (20)

Module – II

13. (a) Explain the operation principle of four-quadrant DC chopper with circuit diagram and plot the output voltage and current waveforms. (10)
- (b) Design and draw a simple drive circuit for power MOSFET. (10)

OR

14. (a) Draw and discuss the steady state and switching characteristics of power MOSFET. (10)
- (b) Explain the working principle of DC-DC step down chopper with circuit diagram and output waveform. Also derive the output voltage expression in terms of duty ratio. (10)



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Module – III

15. Explain the operation of a single phase fully controlled rectifier connected to RL load. With firing angle $\alpha=60^\circ$ and power factor of load is 0.866 draw the voltage and current waveforms across the load and switches (20)

OR

16. (a) Describe the operation of single-phase half-wave converter with RL load. Draw the voltage and current waveforms across RL load. (15)
- (b) List any five applications of controlled rectifiers. (5)

Module – IV

17. Explain v/f speed control method of an induction motor drive. (20)

OR

18. (a) Explain sinusoidal pulse modulation technique in a single phase inverter. Explain how voltage and frequency is varied using this method. (15)
- (b) Explain single pulse width modulation technique used in single phase inverter (5)

