



Reg. No. : .....

Name : .....

**Eighth Semester B.Tech. Degree Examination, January 2018  
(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. What is the function of commutator in a DC motor ?
2. Draw speed Vs torque characteristics of a DC series motor.
3. What is the main advantage of a 3-phase slip-ring induction motor ?
4. Compare between power BJT and power MOSFET.
5. For a step-down chopper, if the input voltage is 30V dc and duty ratio is 0.75, find the output voltage.
6. Draw the output voltage of a 1-phase half-wave controlled rectifier with R load for a firing angle of  $45^\circ$ .
7. Draw the schematic of a 1-phase dual converter.
8. Draw output voltage waveform of a 1-phase half-bridge inverter with R-load.
9. Name the different voltage control techniques in inverters.
10. Draw the block diagram of ON line UPS.



## PART – B

Answer **any one full** question from **each** Module.

**Module – 1**

11. a) Explain the constructional features of a DC machine. 14  
b) A 4-pole DC generator having wave wound armature winding has 51 slots, each slot containing 20 conductors. Calculate the voltage generated in the armature when driven at 1500 rpm. Assume flux per pole to be 0.5 m Wb. 6

OR

12. a) Derive the emf equation of a DC generator. 10  
b) Explain the principle of operation of a 1-phase capacitor start induction motor. 10

**Module – 2**

13. a) Explain the switching characteristics of power MOSFET. 10  
b) Explain the working of a 2-quadrant chopper. 10

OR

14. Explain the working of a four quadrant chopper showing the equivalent circuit in each quadrant. 20

**Module – 3**

15. Explain the working of a 1-phase fully controlled bridge rectifier with RL load with necessary waveforms. 20

OR

16. Explain the working of a dual converter for four quadrant operation with necessary waveforms. 20

**Module – 4**

17. a) Explain the working of a 1-phase full bridge inverter with R load with necessary waveforms. 14  
b) What are the advantages of pulse width modulation ? 6

OR

18. Explain the speed control of 3-phase induction motor using V/f control for speeds below and above synchronous speed. 20