

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIRST SEMESTER M. TECH DEGREE EXAMINATION**  
**Electrical & Electronics Engineering**

**04EE6303—Power Electronic Circuits**

Max. Marks : 60

Duration: 3 Hours

**PART A**

*Answer All Questions*

*Each question carries 3marks*

1. Draw the static characteristics of IGBT.
2. A single phase full wave converter bridge feeds a purely resistive load of  $5\Omega$ . The supply voltage is 230V, 50 Hz. If the average load current is 25A, find the thyristor triggering angle. What is the average value of the thyristor current?
3. Compare circulating and non-circulating current mode operation of dual converters.
4. What is the effect of inductance in load circuit on the output ripple current?
5. Give any three applications of isolated DC-DC converter.
6. Explain the configuration of forward converter.
7. Distinguish between Current source inverter and voltage source inverter.
8. What is a multilevel inverter? How are they classified?

**PART B**

*Each question carries 6marks*

9. Discuss the various thyristor protection schemes.

OR

10. Explain the thyristor switching characteristics during turn-off.
11. A single phase full wave converter is supplied from 230V, 50 Hz source. The load consists of  $R=10\Omega$  and a large inductance so as to render the load current constant. For a firing angle delay of 30degree, determine a) average output voltage b) average output current c) average and rms values of thyristor currents d) the power factor.

OR

12. Draw and explain the working of single phase full converter with RLE load for  $\alpha > 90^\circ$ .
13. List out and explain the control strategies employed for regulating power flow in ac voltage controllers.

OR

14. A single phase full wave converter is operated from 230V, 50Hz source, and the load resistance is  $R = 12\Omega$ . For  $\alpha$  of  $30^\circ$ , determine (i) rectification efficiency (ii) form factor (iii) ripple factor.

15. Derive the expression for peak to peak current ripple and peak to peak output voltage in buck boost regulator.

OR

16. Discuss the operation of a boost regulator .Draw the necessary waveforms and obtain an expression for the output voltage.

17. Discuss the working of flyback converter.

OR

18. Explain the various isolated bridge topologies in detail.

19. Explain any type of multilevel Inverter.

OR

20. Explain briefly different methods of voltage control in inverters.