CBCS SCHEME

USN | | | | | | | | | |

18MT62

Sixth Semester B.E. Degree Examination, June/July 2025
Power Electronics

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define Power Electronics. List the applications of power electronics. **(10 Marks)**

b. Explain various types of power electronics converter circuits with the help of circuits and waveforms. **(10 Marks)**

OR

2 a. Write the symbol and control characteristics of the following devices:
i) SCR
ii) BJT
iii) MOSFET
iv) IGBT
v) GTO **(10 Marks)**

b. Explain the isolation of gate drive using
i) Pulse transformer
ii) Optocoupler. **(10 Marks)**

Module-2

3 a. Explain RC full wave triggering with neat circuit diagram. **(10 Marks)**

b. Explain two transistor model of SCR. **(10 Marks)**

OR

4 a. Define Commutation. Explain with neat circuit diagram and waveforms natural commutation. **(10 Marks)**

b. Define Forced Commutation. Explain class B commutation or resonant pulse commutation with neat circuit diagram. **(10 Marks)**

Module-3

5 a. What is AC voltage controller? Explain the principle of ON-OFF control with neat circuit diagram and waveforms. **(10 Marks)**

b. Explain the operation of single phase bidirectional AC voltage controller with resistive load with circuit diagram and waveforms. **(10 Marks)**

OR

6 a. Explain the principle of phase controlled converter operation with circuit diagram and waveforms. **(10 Marks)**

b. Explain Single Phase Semi-converter with circuit diagram and waveforms. **(10 Marks)**

Module-4

7 a. Explain the principle of step down chopper with neat circuit diagram and waveforms. **(10 Marks)**

b. Explain class D chopper operation with neat circuit diagram. **(10 Marks)**

OR

8 a. Explain the principle of step up clopper with neat circuit diagram and waveforms. **(10 Marks)**

b. Explain the operation of class B chopper with neat circuit diagram. **(10 Marks)**

Module-5

9 a. What is Inverter? Explain performance parameters of inverters. **(10 Marks)**

b. Explain principle of operation of inverters with neat circuit diagram and waveforms. **(10 Marks)**

OR

10 a. Explain single phase bridge inverter with neat circuit diagram and waveforms. **(10 Marks)**

b. Explain the following two types of voltage control in single phase inverters:

i) Single pulse width modulation

ii) Multiple pulse width modulation. **(10 Marks)**

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