

# CBCS SCHEME

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BMT613A

**Sixth Semester B.E./B.Tech. Degree Examination, June/July 2026****Power Electronics**

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.**2. M : Marks , L: Bloom's level , C: Course outcomes.*

| Module – 1 |                                                                                                                                                    | M  | L  | C   |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------|----|----|-----|
| Q.1        | a. Define Power Electronics. List the applications of power electronics.                                                                           | 10 | L2 | CO1 |
|            | b. Explain the isolation of gate drive using :<br>i) Pulse transformers ii) Optocouplers                                                           | 10 | L2 | CO1 |
| OR         |                                                                                                                                                    |    |    |     |
| Q.2        | a. Explain the peripheral effects of power electronic equipments. What are the remedies for them?                                                  | 10 | L2 | CO1 |
|            | b. Write the symbol and control characteristic of the following devices.<br>i) SCR ii) BJT iii) MOSFET iv) IGBT v) GTO.                            | 10 | L2 | CO1 |
| Module – 2 |                                                                                                                                                    |    |    |     |
| Q.3        | a. With neat diagram, write about two transistor model of SCR.                                                                                     | 10 | L2 | CO2 |
|            | b. Define latching current and holding current and write about V-I characteristics of SCR.                                                         | 10 | L2 | CO2 |
| OR         |                                                                                                                                                    |    |    |     |
| Q.4        | a. Define Commutation. With neat circuit diagram and waveforms write about natural commutation.                                                    | 10 | L3 | CO2 |
|            | b. Define Forced commutation and write about self commutation.                                                                                     | 10 | L1 | CO2 |
| Module – 3 |                                                                                                                                                    |    |    |     |
| Q.5        | a. Define AC Voltage Controller. With the help of circuit diagram and waveforms write about the principle of ON-OFF control.                       | 10 | L2 | CO3 |
|            | b. With the help of neat diagram and waveforms. Write about the operation of single phase bidirectional AC voltage controller with resistive load. | 10 | L2 | CO3 |

## OR

|     |    |                                                                                                                  |    |    |     |
|-----|----|------------------------------------------------------------------------------------------------------------------|----|----|-----|
| Q.6 | a. | With the help of neat circuit diagram and waveforms write the principle of phase controlled converter operation. | 10 | L2 | CO3 |
|     | b. | With neat circuit diagram and waveforms, write about single phase semi-converter with R load.                    | 10 | L2 | CO3 |

## Module – 4

|     |    |                                                                                             |    |    |     |
|-----|----|---------------------------------------------------------------------------------------------|----|----|-----|
| Q.7 | a. | With the help of neat circuit diagram write the principle of step down chopper with R load. | 10 | L2 | CO4 |
|     | b. | With the help of neat circuit diagram, write the operation of Class A chopper.              | 10 | L2 | CO4 |

## OR

|     |    |                                                                                |    |    |     |
|-----|----|--------------------------------------------------------------------------------|----|----|-----|
| Q.8 | a. | With the help of neat circuit diagram, write the principle of step up chopper. | 10 | L2 | CO4 |
|     | b. | With the help of neat circuit diagram, write the operation of Class C chopper. | 10 | L2 | CO4 |

## Module – 5

|     |    |                                                                               |    |    |     |
|-----|----|-------------------------------------------------------------------------------|----|----|-----|
| Q.9 | a. | What is an Inverter? Explain performance parameters of inverters.             | 10 | L2 | CO5 |
|     | b. | Explain with neat circuit diagram and waveforms single phase bridge inverter. | 10 | L2 | CO5 |

## OR

|      |    |                                                                                                                                                          |    |    |     |
|------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|-----|
| Q.10 | a. | Explain with neat circuit diagram, and waveforms principle of operation of inverters.                                                                    | 10 | L2 | CO5 |
|      | b. | Explain the following two types of voltage control in single phase inverters.<br>i) Single pulse width modulation<br>ii) Multiple pulse width modulation | 10 | L2 | CO5 |

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