CBCS SCHEME

USN | | | | | | | | | |

BMT613A

Sixth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.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.	Illustrate the relationship between power, electronics and control.	8	L2	CO1
	b.	Describe the peripheral effects of power electronic equipments.	6	L2	CO1
	c.	Using neat diagram, explain power electronic circuit convertors (DC chopper circuit).	8	L2	CO1
		OR			
Q.2	a.	Illustrate the IGBT structure and explain V-I characteristics.	8	L2	CO1
	b.	Explain : i) di/dt rating ii) dv/dt rating.	6	L2	CO1
	c.	With a neat diagram, explain BJT base drive.	8	L2	CO1
		Module – 2			
Q.3	a.	Using V-I characteristics, explain the structure of thyristors.	8	L2	CO2
	b.	With the help of split section NPN and PNP structure, explain thyristor.	6	L2	CO2
	c.	Explain phase controlled thyristors.	6	L2	CO2
		OR			
Q.4	a.	Briefly explain the need of the commutation technique for thyristors and explain two types commutation techniques.	8	L2	CO2
	b.	Illustrate the two transistors model for thyristor.	4	L2	CO2
	c.	Describe the working principal of resonant pulse commutation for thyristor.	8	L2	CO2
		Module – 3			
Q.5	a.	Explain a single phase full wave controller using thyristor and diode.	10	L2	CO2
	b.	Compare single phase full wave controller with resistive and inductor load with respect to RMS output voltage and efficiency.	10	L3	CO3
		OR			
Q.6	a.	Describe the classification of converters. Explain the role of the controlled rectifier.	10	L2	CO3
	b.	Explain single phase full convertors.	10	L2	CO3
		Module – 4			
Q.7	a.	Describe a step-down chopper circuit with inductive load.	10	L2	CO2
	b.	Discuss the methods of control in chopper circuit.	5	L2	CO3
	c.	Describe performance parameters of chopper circuit.	5	L2	CO3
		OR			
Q.8	a.	Explain step-down chopper circuit with resistive load.	10	L2	CO2
	b.	Describe : i) Second quadrant converter (class – B) ii) Four quadrant converter (class – E).	10	L2	CO3
		Module – 5			
Q.9	a.	Illustrate the principle operation of inverter.	10	L2	CO4
	b.	Explain the voltage control of single phase inverter using sinusoidal pulse width modulation.	10	L2	CO4
		OR			
Q.10	a.	Explain the gating sequence for 180° degree conduction.	10	L2	CO4
	b.	Describe single phase inverter using single pulse width modulation.	10	L2	CO4

* * * * *