Seat No.:		Q. Paper Code: FTC-A-014	SET	A

Fabtech Technical Campus, College of Engineering & Research, Sangola

(An Autonomous Institute)

Electrical Engineering

Academic Year: -2025-26, Semester-I

High Power Converter (25PEE11173)

Regular End Semester Examination Winter 2025-26 [Dec./Jan]

Class:	F. Y. M. Tech.	**Day & Date:**	Monday, 05/01/2026
Duration:	03 Hrs.	**Max. Marks:**	60 Marks
Time:	11.00 AM TO 02.00 PM		

Instructions:

1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagram wherever necessary.
4) Make suitable assumptions if necessary and state it clearly.
5) Use of non-programmable calculator is allowed.

Q. No.	Questions	Marks	CO	BL
Q. 1	**Attempt any two of the following**	**12**		
1	Compare diode rectifier and SCR rectifier.	**6**	1	**BL-4**
2	What are the applications of high power converters?	**6**	1	**BL-1**
3	Explain the operation of a multi-pulse diode rectifier with circuit diagram and waveform	**6**	1	**BL-2**
Q. 2	**Attempt any two of the following**	**12**		
1	What are the advantages of multilevel inverters over conventional two-level inverters?	**6**	2	**BL-2**
2	Describe the operation of a cascaded H-bridge multilevel inverter with circuit diagram and output waveform.	**6**	2	**BL-2**
3	Explain the role of phase shifting transformers in multilevel inverter systems with neat diagram	**6**	2	**BL-3**
Q. 3	**Attempt any two of the following**	**12**		
1	Explain the operation of a diode-clamped multilevel inverter with neat circuit diagram and waveform.	**6**	3	**BL-2**
2	Describe the working principle and classification of DC–DC switch mode converters.	**6**	3	**BL-2**
3	Explain the role of multilevel converters in FACTS applications such as STATCOM or SSSC	**6**	3	**BL-3**

Q. 4	**Attempt any two of the following**	**12**		
1	Differentiate between on-line UPS **and** off-line UPS with neat block diagrams.	**6**	4	**BL-1**
2	Describe the operation of a three-phase to single-phase cycloconverter with proper switching sequence, waveforms, and advantages	**6**	4	**BL-3**
3	Draw and explain the complete block diagram of a double-conversion (online) UPS**.** Discuss how it maintains uninterrupted supply during power failure	**6**	4	**BL-3**
Q. 5	**Attempt any two of the following**	**12**		
1	Briefly describe the purpose of a STATCOM in power systems.	**6**	5	**BL-1**
2	Discuss the role of converters in Smart Grid and Micro-grid applications. Explain functions like voltage support, frequency control, and grid integration of renewables.	**6**	5	**BL-4**
3	Describe the operating principle and control strategy of a Unified Power Flow Controller (UPFC). Explain how it regulates voltage, impedance, and power flow	**6**	5	**BL-3**