

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R,S) (FT/S4PT) Examinations April 2026 (2019 Scheme)



Course Code: ECT322

Course Name: POWER ELECTRONICS

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

- | | | |
|----|---|-----|
| 1 | Explain reverse recovery time for a diode. | (3) |
| 2 | What is the difference between holding current and latching current in SCR? | (3) |
| 3 | List the advantages of 3 phase rectifier over single phase. | (3) |
| 4 | Explain a snubber circuit operation across a power transistor. | (3) |
| 5 | Draw the circuit of half bridge converter | (3) |
| 6 | Explain the concept of volt-second balancing. | (3) |
| 7 | Draw the circuit of half bridge inverter. | (3) |
| 8 | Explain the working principle of the push-pull inverter. | (3) |
| 9 | How converters are used in induction heating? | (3) |
| 10 | Mention two residential applications of power electronics | (3) |

PART B

Answer one full question from each module, each carries 14 marks.

Module I

- 11 a) Draw the structure of the power transistor and explain the static and dynamic characteristics. (14)

OR

- 12 a) Draw the structure of IGBT and explain the working. (7)
b) With the two-transistor model of SCR, explain the working principle of SCR (7)

Module II

- 13 a) Design any two base drive circuits for power MOSFET. (7)
b) Illustrate the base current requirement of power BJT (7)

OR

- 14 a) Explain single-phase full wave bridge converter with RLE load using relevant voltage and current waveforms for continuous load current. (14)

Module III

- 15 a) Draw and explain the circuit diagram of the boost converter with inductor current and switching waveform (7)

- b) Illustrate the working of half bridge isolated converters (7)

OR

- 16 a) Describe the principle of operation of flyback converter with necessary waveforms (7)

- b) Draw and explain a full bridge converter with circuit diagrams and waveforms (7)

Module IV

- 17 a) What is Space vector modulation in three phase inverters (7)

- b) Illustrate the PWM switching scheme for sine wave output of the inverter. (7)

OR

- 18 a) Enumerate the working principle of three phase inverter (14)

Module V

- 19 a) Explain two industrial applications of power electronics (7)

- b) What is DC motor drive? List types of DC Motor Drives (7)

OR

- 20 a) Explain dissipative braking scheme in Induction Motor drive. (7)

- b) Explain the principle of adjustable speed DC drive using switched mode DC-DC converter (7)
