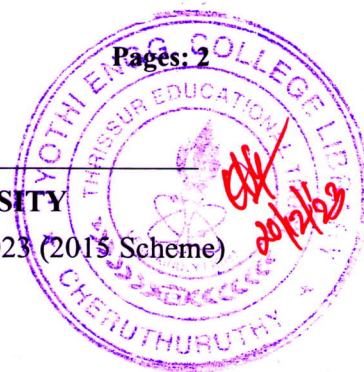


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S5 (S, FE) / S3 (PT) (S, FE) Examination December 2023 (2015 Scheme)

**Course Code: EC307****Course Name: POWER ELECTRONICS & INSTRUMENTATION**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer any two full questions, each carries 15 marks.*

Marks

- 1 a) With neat diagram, explain the structural features of Power BJT. (6)
- b) Explain the steady-state output and switching characteristics of Power BJT (9)
- 2 a) Explain the working of a non-isolated buck-boost DC-DC converter with circuit diagram and necessary waveforms. (8)
- c) Explain the isolated full bridge DC-DC converter with the help of circuit diagram and necessary waveforms. (7)
- 3 a) With neat diagram, explain the operation of flyback converter. (8)
- b) Explain how electrical switches are classified? Give examples of power semiconductor switches for each type. What are the properties of an ideal semiconductor switch? (7)

PART B*Answer any two full questions, each carries 15 marks.*

- 4 a) Explain the working principle of space vector PWM inverter for a three phase full bridge inverter. (12)
- b) What is need for the "dead time" in a full bridge inverter circuits? (3)
- 5 a) Explain in detail, the functional block diagram of a generalised measuring instrument (9)
- b) Explain the principle of resistance measurement using Whetstone's bridge with the help of a schematic. (6)
- 6 a) With neat circuit diagram and relevant waveforms, explain the principle of single pulse width modulation applied to a single phase full bridge inverter. (8)
- b) Explain the principle of inductance measurement using MAXWELL bridge and derive the balancing condition. (7)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Explain the working of a general purpose spectrum analyzer with a neat block diagram (10)
- b) Explain the working of a digital voltmeter with a block diagram. (10)
- 8 a) Explain the working of
- (i) Hall Effect sensor, (7)
 - (ii) Proximity sensor, (7)
 - (iii) capacitor microphone (6)
- 9 a) Explain the steps involved in the selection of a transducer? (5)
- b) Explain the principle of a strain gauge transducer. (5)
- c) Explain the working of a PLL based frequency synthesizer. (10)
