

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Fifth semester B.Tech degree examinations (S) September 2020

**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) Explain the structure of power BJT with neat schematic. (6)
- b) Explain switching characteristics of power diode with the help of waveform. (6)
- c) What is the importance of free-wheeling diodes in converters? (3)
- 2 a) Draw and explain the circuit diagram of Boost converter with inductor current and switching waveform. (8)
- b) Describe the working of IGBT and draw input and output characteristics. How does latch up occurs in IGBT? (7)
- 3 a) Define the working of fly back converter with neat diagram. (5)
- b) Draw the VI characteristics of GTO and list its various modes. (3)
- c) Explain the working of full bridge isolated converters with help of circuit diagram and relevant waveform. (7)

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

- 4 a) List any five differences between offline UPS and online UPS. (5)
- b) With neat circuit diagram and switching waveform explain the working of push pull inverters. (10)
- 5 a) Explain how to measure an unknown resistance using Wheatstone's bridge with the help of schematic. (5)
- b) Describe phase vector modulation of three phase inverter. (5)
- c) Define the following Static Characteristics: (5)  
i) Accuracy ii) Precision iii) Repeatability iv) Reproducibility v) Resolution
- 6 a) List any two differences between half bridge and full bridge inverter. (3)
- b) Explain different classification of instruments. (8)
- c) Define Q-factor. (4)

**PART C**

*Answer any two full questions, each carries 20 marks.*

- 7 a) Differentiate transducer from sensor. Explain various classification of transducer with examples. (10)
- b) Describe the working of Audio power meter with circuit diagram. (10)
- 8 a) What is the working principle of resistance transducer? Explain the working of strain gauge with neat sketch. (8)
- b) Describe the operation of proximity transducer with neat diagram. (6)
- c) Explain the block diagram of logic state analyser. (6)
- 9 a) List out any four specifications of digital voltmeter. (4)
- b) Explain the working principle of Hall effect transducer with neat diagram. (6)
- c) Explain the measurement of frequency using digital instrument with neat schematic. (10)

\*\*\*\*