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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

Course Code: EC307

Course Name: POWER ELECTRONICS & INSTRUMENTATION (EC)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks. Marks

1 a) Explain in details the static characteristics of Power BJT. Compare the I-V characteristics of Power BJT with low signal BJT. (8)

b) What is meant by a boost converter? Explain using relevant circuit diagram and waveforms. Write down the expression for output ripple voltage. (7)

2 Describe the structure of Power MOSFET by explaining channel formation. Draw its I-V characteristics labelling different voltages as well as regions of operation. Also draw the switching characteristics. (15)

3 a) Describe Forward converter including its circuit, wave forms and expressions. (5)

b) Explain Push-pull converter including its circuit, wave forms and expressions. (5)

c) Explain full bridge DC-DC converter with the help of circuit diagram and suitable waveforms. (5)

PART B

Answer any two full questions, each carries 15 marks.

4 a) What is the general arrangement of an online UPS system? Explain with the help of block diagram. (5)

b) How to measure resistance using Wheatstone's bridge? (5)

c) With neat block diagram explain functional elements of measuring instruments. (5)

5 a) Describesingle phase half bridge inverter explaining the principle of sinusoidal PWM switching scheme. (7)

b) Explain the concept of space vector modulation? (8)

6 a) Define the following Static Characteristics: (10)

i) Resolution ii) Precision iii) Repeatability iv) Linearity v) Sensitivity

b) How to measure inductance using Maxwell-Wein's Bridge. (5)

PART C

Answer any two full questions, each carries 20 marks.

7 a) What is the principle of operation of a resistance transducer? Explain the working of strain gauge. (8)

b) Draw and explain the block diagram of Frequency synthesizer. (6)

c) What is RF power meter? Explain its working. (6)

8 a) What is a transducer? Explain the classification of transducers. (7)

b) Describe the Construction and working of LVDT with neat schematic. (8)

c) Explain the working of a Hall effect transducer. (5)

9 a) Discuss DSO with the help of a block diagram. (8)

b) Draw and explain the block diagram of Spectrum Analyzer. (6)

c) Describe digital voltmeter with neat block diagram. (6)

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