

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) |
