

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

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.

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| 1 a) Compare power MOSFETs and power BJTs. | (5) |
| b) With neat sketch explain the static and dynamic characteristics of power diodes. | (10) |
| 2 a) Draw the circuit of a Buck converter and explain its working with relevant waveforms. | (6) |
| b) What are the advantages of isolated converter circuits over the basic converter circuits? Explain the forward converter circuit with relevant waveforms. | (9) |
| 3 a) Draw the structure of an IGBT and explain its operation. | (8) |
| b) Explain the operation of a Flyback converter. | (7) |

PART B

Answer any two full questions, each carries 15 marks.

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| 4 a) With relevant waveforms explain the circuit of a push pull single phase inverter circuit. | (9) |
| b) Explain the principle of space vector modulation in three phase inverter circuits. | (6) |
| 5 a) Draw the block diagram and explain the functional elements of an instrument? | (5) |
| b) What do you mean by static characteristics of an instrument? Define any six static parameters of an instrument. | (10) |
| 6 a) Explain the principle of operation of switched mode inverters. Draw the circuit of a full bridge single phase inverter circuit and explain its operation with relevant waveforms for R load. | (8) |
| b) Draw a Maxwell's bridge circuit and derive the condition for balance of the bridge for finding the unknown inductance value. | (7) |

PART C

Answer any two full questions, each carries 20 marks.

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| 7 a) Mention a few criterion that has to be considered in the selection of transducer for a particular application. | (5) |
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- b) What is the principle of operation of Hall effect transducers? Mention any two applications. (7)
- c) What is the working principle of strain gauge? Explain the various types of strain gauges with neat sketches. (8)
- 8 a) Explain the operating principle of time measurement of a signal using digital instruments. (8)
- b) Write notes on: (12)
- (i) spectrum analyzer
- (ii) Electronic multimeter
- 9 a) Explain the principle of operation of proximity transducers. Give two applications. (10)
- b) With a block diagram describe Logic State Analyzer. (10)
