

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

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

**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 the constructional details and the working of power MOSFET. Also bring out the difference between low power MOSFET and power MOSFET. | (10)  |
| b) Explain the principle of operation of boost converter.   | (5)   |
| 2 a) Define softness factor of power diodes.  | (2)   |
| b) Describe the working of IGBT. How does Latch-up occur in IGBT?   | (5)   |
| c) Explain the switching waveform of power transistor. Also describe its input and output characteristics.  | (8)   |
| 3 a) Explain the working principle of buck converter and illustrate the operation with the inductor current and the switching waveforms.          | (8)   |
| b) Explain the principle of operation of full bridge isolated converter topology.   | (7)   |

**PART B**

*Answer any two full questions, each carries 15 marks*

- |   |      |
|---|------|
| 4 a) Explain the working principle of push pull inverter.   | (5)  |
| b) Describe the principle of operation of Wheatstone bridge and derive the expression for unknown resistance. | (8)  |
| c) Distinguish between choppers and inverters.  | (2)  |
| 5 a) Explain the space vector modulation in three phase inverters.  | (10) |
| b) Explain Self oscillating type and driven type inverters.   | (5)  |
| 6 a) Explain different classification of instruments.   | (12) |
| b) What is the criterion for balance of Schering's bridge?  | (3)  |

**PART C**

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

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|---|------|
| 7 a) Explain the range changing circuit of digital voltmeter.   | (5)  |
| b) Explain the principle of operation of resistance transducer. Explain the difference between bonded and unbounded type strain gauges. | (10) |
| c) Explain the block diagram of swept super heterodyne spectrum analyser.   | (5)  |
| 8 a) Explain the principle of operation of LVDT. List out its advantages.   | (7)  |
| b) What are the major guidelines for the selection of transducers?  | (5)  |
| c) Explain about any two types of capacitive transducers.   | (8)  |
| 9 a) Explain the block diagram of frequency synthesizer with waveforms.   | (6)  |
| b) Draw and explain the basic block diagram of DSO. Sketch the system waveforms and list out its applications.                          | (10) |
| c) Explain about ramp type digital voltmeter.   | (4)  |

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