Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

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) Draw the structure of a power BJT and explain its static and dynamic characteristics. Explain the phenomenon of quasi saturation in power BJTs. (12)

b) Distinguish between linear electronics and power electronics. (3)

2 a) Draw the circuit of a Buck Boost converter and explain its various modes of operation with relevant waveforms. Also write the expression for output voltage, voltage and current ripple under continuous conduction mode. (9)

b) With a neat circuit diagram, explain the operation of a push pull converter circuit with all relevant waveforms. (6)

3 Draw the structure of a power MOSFET and explain its operation. Also explain the static and switching characteristics. Mention a few advantages of power MOSFETs compared to power BJTs. (15)

PART B

Answer any two full questions, each carries 15 marks.

4 Write notes on: (15)

(i) Principle of switched mode inverters.

(ii) Space vector modulation.

(iii) Push pull single phase inverters.

5 a) Explain the various classification of instruments with suitable examples. (10)

b) Distinguish between static characteristics and dynamic characteristics of an instrument? (5)

6 a) Draw a bridge circuit for measuring capacitance and derive the balance condition of the bridge for determining unknown capacitance value. (8)

b) For a Maxwell's bridge, given R1= 10 kohm, C1=10 micro Farad, R2=R3=1 kOhm, find unknown Rx and Lx. (7)

PART C

Answer any two full questions, each carries 20 marks.

7 a) How the transducers are classified? Explain the working principle of a strain (10)

gauge.

b) Explain the working of a capacitor micro phone with relevant figures. (10)

8 a) Explain: (12)
(a) Frequency synthesizer
(b)Electronic multimeter

b) What is the principle of operation of proximity transducers? Explain inductive and capacitive type proximity transducers. (8)

9 a) With a neat sketch, explain the working principle of a digital storage oscilloscope? List a few applications. (10)

b) Explain the operating principle of the following transducers: (10)

(i) Hall effect transducers

(ii) LVDT

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