Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 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
1a)	With neat diagram, explain the structural features of Power MOSFET.	(6)
1b)	Draw the Safe Operating Area (SOA) of (i) Power BJT (ii) Power MOSFET	(6)
1c)	Explain the second breakdown phenomena in Power BJT	(3)
2a)	Explain the switching characteristics of a power MOSFET	(7)
2b)	With neat diagram, explain the working principle of an isolated full-bridge DC-DC converter.	(8)
3a)	Explain the working of a non-isolated buck DC-DC converter. Also obtain the expression for the output voltage in terms of duty-ratio and input voltage.	(7)
3b)	With neat block diagram, explain the working of an isolated multiple output switched mode power supply	(6)
3c)	Compare the linear regulated power supply with a switched mode power supply	(2)

PART B

Answer any two full questions, each carries 15 marks.

4a)	With neat diagram, explain the working principle of a full-bridge square wave inverter with RL load. Indicate the commutation sequences of the devices.	(8)
4b)	The single-phase full bridge inverter has a resistive load of R=10Ω and the dc input voltage is Vs=220 V. Determine (a) the rms output voltage at the fundamental frequency Vo_1(rms); (b) The output power P_o	(7)
5a)	Explain the working principle of a space vector PWM inverter.	(9)
5b)	Explain the principle of measurement of resistance using Wheatstone bridge.	(6)
6a)	Explain the principle of measurement of capacitance using Schering's bridge.	(6)
6b)	Explain the static characteristics of a measuring instrument	(9)

PART C

Answer any two full questions, each carries 20 marks.

7) Explain the working principle of (i) Capacitance transducer (ii) Hall Effect Transducer (iii) Proximity Transducer (20)

8a) Explain the working principle of a capacitor microphone (6)

8b) Explain the working principle of Audio Power meter (6)

8c) With neat block diagram, explain the working principle of spectrum analyzer (8)

9a) Explain the working principle of digital voltmeter (8)

9b) With neat block diagram, explain the working principle of Logic analyzer (12)

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