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Pages: 2

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech degree examinations (S), September 2020 (S1/S2 - 2015 Scheme)

Course Code: BE101-04

Course Name: INTRODUCTION TO ELECTRONICS ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks. Marks

1		Two ceramic capacitors with markings 102 and 103 are connected in parallel. Find the effective capacitance value.	(5)
2		What are the two types of breakdown phenomena in diodes? Explain each.	(5)
3		Explain the need for biasing and stabilization in BJT circuits	(5)
4		Explain the working of a photo transistor with its characteristics.	(5)
5		Sketch circuit diagram of a zener diode shunt voltage regulator. Explain its operation?	(5)
6		Define ripple factor. Calculate its value for a full wave rectifier.	(5)
7		Explain the terms accuracy, sensitivity, resolution related to electronic measuring instruments.	(5)
8		Explain how frequency and phase of signals are measured using Lissajous patterns in a CRO.	(5)

PART B

Answer six questions, one full question from each module and carries 10 marks.

Module I

9		What are the various types of resistors? Explain the constructional details of any two in detail.	(10)

OR

10		Explain the working of an electro mechanical relay with diagram and give any one application of relay.	(10)

Module II

11	a)	Explain the diode current equation.	(3)
	b)	Determine the diode current at 20°C for a Silicon diode with reverse saturation current of 50 nA and an applied forward bias of 0.6V. Now, if the reverse saturation current increases to 5.0 μA at 100°C, calculate the diode current for	(7)

the new temperature. Assume that $\eta = 2$ for both cases.

OR

12 a) Explain the piece wise linear model of a diode. Also draw the V-I characteristics (6)

b) Explain how a varactor diode can be used as a variable capacitor? (4)

Module III

13 a) Define α and β of a transistor. Derive the relation between two. (6)

b) In Common Emitter input characteristics why does the V_{BE} versus I_B curve move outwards for higher values of V_{CE}? (4)

OR

14 Draw and explain the input and output characteristics of an NPN transistor in common base configuration (10)

Module IV

15 Explain the structure and working of an enhancement type MOSFET with its V-I characteristics (10)

OR

16 Explain with relevant figures the structure and characteristics of SCR and draw the two transistor model of the same. (10)

Module V

17 a) Describe with circuit diagram and waveform the working of a full wave centre tapped rectifier. (8)

b) Define rectification efficiency and peak inverse voltage. (2)

OR

18 Draw and explain the circuit diagram, output waveform and transfer characteristics of a double clipper with clipping levels at 3Vand -5V, if an input sine wave of peak to peak voltage of 20V is applied. (10)

Module VI

19 a) Explain the principle of operation of an analog multimeter. (7)

b) Compare analog and digital multimeter (3)

OR

20 a) Explain the need of a saw tooth voltage to display a waveform on a CRO. (4)

b) Draw and explain the block diagram of a function generator. (6)

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