

Reg No.: _____

Name: _____

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. (5)
Find the effective capacitance value.
- 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 (5)
operation?
- 6 Define ripple factor. Calculate its value for a full wave rectifier. (5)
- 7 Explain the terms accuracy, sensitivity, resolution related to electronic (5)
measuring instruments.
- 8 Explain how frequency and phase of signals are measured using Lissajous (5)
patterns in a CRO.

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 (10)
two in detail.

OR

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

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 (7)
current of 50 nA and an applied forward bias of 0.6V. Now, if the reverse
saturation current increases to 5.0 μ A at 100°C, calculate the diode current for

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 3V and -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)
