

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST/SECOND SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019

Course Code: EC100

Course Name: BASICS OF ELECTRONICS ENGINEERING

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks.

Marks

- | | | |
|---|---|-----|
| 1 | Discuss any two applications of electronics from each of the following fields: (a) industry and instrumentation. (b) medicine | (5) |
| 2 | Draw the energy band diagram of conductors, semiconductors and insulators. Also compare the energy band gap between them. | (5) |
| 3 | Draw the Block diagram of a public addressing system and explain. | (5) |
| 4 | Define the terms CMRR and slew rate. Give its value for an ideal op-amp. | (5) |
| 5 | Explain the concept of modulation and different modulation techniques. | (5) |
| 6 | What are geostationary satellites? Explain. | (5) |
| 7 | What is meant by a) hand-off b) Total internal reflection | (5) |
| 8 | List out the major advantages of optical communication system. What are the sources and detectors used in optical fibre communication system? | (5) |

PART B

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

Module I

- | | | |
|---|--|-----|
| 9 | a) How an electromagnetic relay is different from contactors. | (4) |
| | b) Explain any <i>two</i> type of fixed resistors with necessary diagrams. | (6) |

OR

- | | | |
|----|---|-----|
| 10 | a) Draw and explain the construction of a wet electrolytic capacitor. | (5) |
| | b) What is the basic principle of transformer? Mention the important applications of transformer. | (5) |

Module II

- | | | |
|----|---|-----|
| 11 | a) Draw and explain the forward and reverse characteristics of a PN junction diode. | (5) |
| | b) Differentiate between avalanche and zener breakdown. | (5) |

OR

- 12 Explain the working of LED and photodiode. Draw the necessary figures (10)
wherever applicable..

Module 1II

- 13 Explain how transistor works as an amplifier. In an npn transistor $I_C = 9.9505\text{mA}$, $I_E = 10\text{mA}$, leakage current $I_{CBO} = 0.5\mu\text{A}$. Determine I_B, α and I_{CEO} . (10)

OR

- 14 With a neat circuit diagram and waveforms, explain the working of a full wave bridge rectifier with a capacitor filter. (10)

Module 1V

- 15 Draw circuit diagram and derive expressions for gain of inverting and non-inverting amplifier using Op-amp. (10)

OR

- 16 Draw the block diagram of Digital Storage Oscilloscope and explain the Working. (10)

Module V

- 17 a) Write down the expression for AM wave and explain. (4)
b) Explain the working of super heterodyne receiver. (6)

OR

- 18 Explain satellite communication with block diagram (10)

Module VI

- 19 a) With necessary diagram, explain how light is transmitted through an optical fibre? (5)
b) Explain each block of DTH system. (5)

OR

- 20 a) Explain the concept of cells and frequency reuse. (5)
b) Explain each block of CCTV system. (5)
