

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:<br>(a) industry and instrumentation.<br>(b) medicine           | (5) |
| 2 | Draw the energy band diagram of conductors, semiconductors and insulators.<br>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<br>a) hand-off<br>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  $I_B, \alpha$  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)

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