

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
FIRST/SECOND SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

**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 | Explain with diagram, the operation of an electromagnetic relay.   | (5) |
| 2 | Draw and explain the forward and reverse characteristics of a PN junction diode using the diode equation.      | (5) |
| 3 | Draw circuit diagram and explain how Zener diode can be used as a voltage regulator.                           | (5) |
| 4 | Draw the functional block diagram of operational amplifier and explain the functions of each block.            | (5) |
| 5 | Distinguish between LEO, MEO and GEO satellites.   | (5) |
| 6 | Explain the need for modulation. Write two drawbacks of frequency modulation compared to amplitude modulation. | (5) |
| 7 | Explain working of CCTV with block diagram.  | (5) |
| 8 | With a block schematic explain functioning of a typical optical communication system.                          | (5) |

**PART B**

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

**Module I**

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|---|---|-----|
| 9 | a) With neat diagrams, explain construction of wire wound resistor and carbon composition resistors.    | (5) |
|   | b) A carbon resistor has colour code violet, grey, yellow and gold. Find the range of resistance value. | (5) |

**OR**

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|----|--|------|
| 10 | Write the principle of working of transformer. Explain the losses that occur in a transformer. | (10) |
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**Module II**

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|----|--|-----|
| 11 | a) Explain the formation of depletion region in PN junction. | (5) |
|    | b) Explain the principle of operation of LED.                | (5) |

**OR**

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|----|--|------|
| 12 | Describe the construction and operation of NPN transistor. | (10) |
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**Module III**

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|----|--|-----|
| 13 | a) With circuit diagram and waveforms, explain the working of centre tapped full wave rectifier. | (5) |
|    | b) Draw the block diagram of a public address system and specify the functions of each block.    | (5) |

**OR**

- 14 Explain with circuit diagram the working of common emitter amplifier. (10)

**Module IV**

- 15 a) Implement OR and AND gates using NOR gates only. (5)  
b) Write the characteristics of an ideal opamp. Define the terms CMRR, slew rate as related to opamp. (5)

**OR**

- 16 Draw the block diagram of digital storage oscilloscope and explain the functions of each block. (10)

**Module V**

- 17 a) Define amplitude modulation. Derive an expression for representing amplitude modulated wave. (5)  
b) With block diagram explain functions of a satellite transponder. (5)

**OR**

- 18 Explain working of super heterodyne receiver with block diagram. Write its advantages compared to tuned radio frequency receivers. (10)

**Module VI**

- 19 a) Explain how light is transmitted through optical fiber. Write two advantages of optical communication systems. (5)  
b) With block diagram explain working of cable TV network. (5)

**OR**

- 20 Explain the concept of cells, frequency reuse and hand off in cellular mobile communication. (10)

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