

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIRST SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019**

**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 | Explain the constructional details of ceramic capacitors with diagram.  | (5) |
| 2 | What are extrinsic and intrinsic semiconductors? Draw the crystalline structure of N-type semiconductor.  | (5) |
| 3 | For a PNP transistor the base current and collector current are $45\mu\text{A}$ and $5.45\text{mA}$ respectively. Determine (i) values of $\alpha$ , $\beta$ and (ii) Base current required to make collector current of 10 mA. | (5) |
| 4 | Why an FET is said to be a voltage controlled device? What is meant by pinch off voltage of FET?  | (5) |
| 5 | Draw circuit diagram of a negative clipping circuit. Draw its input and output wave forms and explain its operation   | (5) |
| 6 | Define rectification efficiency. Calculate its value for a full wave rectifier.   | (5) |
| 7 | How can we test an NPN transistor using multi meter?  | (5) |
| 8 | Explain the terms accuracy, sensitivity, resolution related to electronic measuring instruments.  | (5) |

**PART B**

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

**Module I**

- |   |   |     |
|---|---|-----|
| 9 | a) A carbon resistor has colour code orange, violet, yellow and silver. Find the range of resistance value. | (5) |
|   | b) What are the specifications of a capacitor? List the different types of capacitors                       | (5) |

**OR**

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|----|--|-----|
| 10 | a) With a neat diagram, explain the working of an electromechanical relay. | (7) |
|    | b) Compare an electromechanical relay with a solid state relay.            | (3) |

**Module II**

- |    |   |     |
|----|---|-----|
| 11 | a) Give diode equation and explain the different terms.                 | (4) |
|    | b) Discuss the forward and reverse characteristics of PN junction diode | (6) |

**OR**

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|----|--|-----|
| 12 | a) Explain the principle of operation of an LED. List any two types of | (5) |
|----|--|-----|

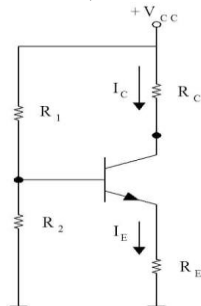
semiconductor materials used in the construction of LED.

- b) With the help of a diagram explain the working of a solar cell. (5)

### Module III

- 13 a) For the given NPN transistor configuration find the quiescent values  $V_{CEQ}$  and  $I_{CQ}$ . (7)

Given  $R_1=15\text{ k}\Omega$ ,  $R_2=2.7\text{ k}\Omega$ ,  $R_E=1\text{ k}\Omega$  and  $R_C=1\text{ k}\Omega$ ,  $V_{CC}=12\text{V}$ ,  $\beta=100$ .



- b) Compare the three BJT configuration based on the major parameters. (3)

**OR**

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

### Module IV

- 15 Describe the structure and characteristics of n-channel depletion type MOSFET. (10)

**OR**

- 16 a) Explain the working of a photo transistor with its characteristics. (6)  
b) Draw the structure and two transistor equivalent circuit of SCR. (4)

### Module V

- 17 Explain the working of a bridge rectifier with circuit diagram and waveform. (10)

**OR**

- 18 a) Draw and explain zener diode voltage regulator. (5)  
b) Explain the working of a capacitor filter in a power supply with input and output waveform. (5)

### Module VI

- 19 a) With the help of a block diagram explain the working of a function generator. (5)  
b) Describe the working of an analog multimeter. (5)

**OR**

- 20 a) Explain the working of a CRO with block diagram. (7)  
b) Explain how CRO can be used to measure frequency. (3)

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