

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

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

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| 1 | With the help of neat diagram, explain the construction and working of electrolytic capacitor. | (5) |
| 2 | With the help of energy band diagram explain insulators, conductors and semiconductors. | (5) |
| 3 | Draw the block diagram of a DC power supply and mention the functions of each block. | (5) |
| 4 | Why are universal gates called so? Realize a two input OR gate using any one of the universal gates. | (5) |
| 5 | Write main features of the orbit of a geo stationary satellite. | (5) |
| 6 | Draw the frequency spectrum of an amplitude modulated (AM) wave. Given that modulating signal is of frequency f_m , amplitude V_m and carrier of frequency f_c , amplitude V_c . Take modulation index as m . What is the bandwidth requirement of this AM wave? | (5) |
| 7 | Draw and explain the structure of an optical fiber cable. | (5) |
| 8 | With supporting diagram explain frequency reuse done in cellular communication. | (5) |

PART B

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

Module I

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| 9 | a) Write the significance of specifying tolerance value of a component. A ceramic capacitor has got the following code marked on its surface. Identify the capacitance value. (i) 103J (ii) 2n2 | (5) |
| | b) Explain the basic working principle of transformer. Write the equation relating primary and secondary voltages to turns ratio. | (5) |

OR

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| 10 | a) Explain the working of electromagnetic relays. | (5) |
| | b) Write and explain any five applications of Electronics in industry. | (5) |

Module II

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| 11 | With neat diagrams, explain the input and output characteristics of a common emitter NPN transistor. | (10) |
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OR

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| 12 | a) Derive the relation between α and β for a transistor. For an npn transistor, $\alpha =$ | (5) |
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0.995 and $I_E = 10\text{mA}$. Find I_B and I_C .

- b) Explain the diode equation. The forward current flowing through a diode at room temperature is 1mA when the forward bias applied is 0.2V . The reverse saturation current through the diode is $0.45\mu\text{A}$ at room temperature. Determine whether the diode is made up of Silicon or Germanium. (5)

Module III

- 13 a) Draw the block diagram of a public-address system and specify the functions of each. (5)
- b) Draw the circuit diagram of an RC phase shift oscillator and explain the need of each component. (5)

OR

- 14 With suitable circuit diagram explain how a Zener diode can be used as a voltage regulator. Differentiate between line regulation and load regulation. (10)

Module IV

- 15 a) Draw the functional block diagram of an operational amplifier. Define any two parameters and specify its ideal values. (5)
- b) Draw circuit diagram and derive expressions for gain of inverting and non-inverting amplifier using Op-Amp. (5)

OR

- 16 a) Explain the working of digital multimeter with a block diagram. (5)
- b) Draw the block diagram of Digital Storage Oscilloscope and explain the working (5)

Module V

- 17 a) Explain satellite communication system with block diagram. (5)
- b) Explain advantages and disadvantages of satellite communication. Specify one frequency band used for satellite communication. (5)

OR

- 18 a) Draw block diagram and explain functioning of superheterodyne receiver. (5)
- b) Write the principle of frequency modulation and list the advantages of FM over AM. (5)

Module VI

- 19 a) What is meant by critical angle? What is its significance in optical fiber communication? (5)
- b) Draw and explain functional block diagram of cellular communication system (5)

OR

- 20 a) Use block diagram representation to explain the functioning of DTH. (5)
- b) With the help of suitable diagrams, explain the working of CCTV. Give one application. (5)
