

F

F7154

Total Pages: 2

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

- 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

- 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

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

Module II

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

OR

- 12 a) Derive the relation between α and β for a transistor. For an npn transistor, $\alpha =$ (5)

F

F7154

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. <http://www.ktuonline.com> (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)
