R15

Code No: 123AU

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, March - 2017
ELECTRONIC DEVICES AND CIRCUITS
(Common to CSE, ECE, EEE, EIE, ETM, IT, MCT)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
. Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(25 Marks)

1.a) Draw Zener Diode Characteristics. [2]
b) Draw the Diode Equivalent Circuit. Mention the applications of PN-junction diode. [3]
c) Explain how P-N junction diode acts as a Rectifier. [2]
d) Explain the necessity of filter circuit after the rectifier circuit. [3]
e) Explain how transistor work as an amplifier. [2]
f) Compare CE,CC and CB configurations. [3]
g) What is the need of biasing? [2]
h) Explain Bias Compensation using Diodes. [3]
i) Compare BJT and FET. [2]
j) How FET acts as Voltage Variable Resistor? [3]

PART-B

(50 Marks)

2.a) Explain the Avalanche and Zener Breakdowns in PN junction diode.
b) What is tunneling phenomena? Explain the principle of operation of tunnel diode with its characteristics. [5+5]

OR

3.a) Derive the expression for transition capacitance of a diode.
b) Define varactor diode? Explain the operation of varactor diode with its equivalent circuit and mention its applications. [5+5]

4. A sinusoidal voltage whose V_m=26V is applied to half-wave rectifier. The diode may be considered to be ideal and R_L=1.2 KΩ is connected as load. Find out peak value of current, RMS value of Current, DC value of current and Ripple factor. [10]

OR

5.a) Derive the expression for Ripple factor for Full Wave Rectifier with L-section filter.
b) Compare FWR and Bridge rectifier. [5+5]

6. The reverse leakage current of the transistor when in CB configuration is 0.3μA while it is 16μA when the same transistor is connected in CE configuration. Determine α, β and γ. [10]

OR

7.a) Explain input and output characteristics of transistor in CB configuration with neat diagram.

b) Discuss the base width modulation. [5+5]

8.a) Derive the operating point using AC and DC load lines.

b) Draw the circuit diagram of a voltage divider bias and derive expression for Stability factor. [4+6]

OR

9. Draw the circuit diagram of CC amplifier using hybrid parameters and derive the expression for A_I, A_V, R_i and R_O. [10]

10. Explain the different biasing techniques of JFET. [10]

OR

11. Describe the construction and working principle of Enhancement mode and depletion mode MOSFET and draw its characteristics. [10]