R18

Code No: 153AT

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year I Semester Examinations, August/September 2022
ELECTRONIC DEVICES AND CIRCUITS
(Common to ECE, EIE, MCT)

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

Answer any five questions
All questions carry equal marks

1.a) Derive the expression for diffusion capacitance of a diode.
b) Discuss how a diode could be used as switch and define all switching times. [8+7]

2.a) Derive ripple factor for a bridge rectifier.
b) Derive expressions for ripple factor of a Full Wave Rectifier with and without a capacitive filter. [8+7]

3.a) Determine IC, IE and α for a transistor circuit having IB=15μA and β=150.
b) Draw and explain the working principle of CE characteristics of a transistor. [8+7]

4.a) Find the Qpoint of selfbias transistor circuit with the following specifications: VCC = 22.5V, RL = 5.6kΩ, RC = 1kΩ, R1 = 90kΩ, R2 = 10kΩ, VBE = 0.7V and β = 55.
Assume IB>> ICO.
b) The reverse leakage current of the transistor when in CB configuration is 0.3 μAwhile it is 16 μAwhen the same transistor is connected in CE configuration. Determine α, β and γ. [8+7]

5.a) Differentiate between a BJT and FET.
b) Explain the operation of FET with its characteristics and explain the different regions in transfer characteristics. [8+7]

6.a) Draw the symbol and equivalent circuit of a UJT. Explain the operation of UJT with the help of its V – I characteristics.
b) With neat sketches explain about the regulation characteristics of Zener diode. [8+7]

7.a) For a CE amplifier given IE= 2.5mA, hfe= 140, hoe= 20μs and hob= 0.5μs. Draw hybrid equivalent circuit.
b) Compare the three transistor amplifier configurations with related to AI, AV, Ri and RO. [8+7]

8.a) With neat sketches, necessary equations explain the drain and transfer characteristics of MOSFET in depletion mode.
b) Draw the smallsignal model of common drain JFET amplifier. Derive expressions for voltage gain and output resistance. [8+7]

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