

R18

Code No: 153AT

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, October - 2020

ELECTRONIC DEVICES AND CIRCUITS

(Common to ECE, EIE, MCT)

Time: 2 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Explain the operation of Full Wave Rectifier with necessary graphs. [8+7]
b) Derive the expression for transition capacitance of a diode.
- 2.a) Derive the expression for Ripple factor for Full Wave Rectifier with L-section filter. [8+7]
b) Explain the working of p-n diode in forward and reverse bias conditions.
- 3.a) Derive the operating point using AC and DC load lines. [8+7]
b) Explain about Punch through and Base width modulation.
- 4.a) Draw and explain the CE characteristics of a transistor.
b) The reverse leakage current of the transistor when in CB configuration is $0.3\mu\text{A}$ while it is $16\mu\text{A}$ when the same transistor is connected in CE configuration. Determine α , β and γ . [9+6]
- 5.a) With the help of neat diagram explain the voltage divider biasing method for FET.
b) Explain the construction and emitter characteristics of UJT. [8+7]
- 6.a) Why we call FET as a Voltage Controlled Device.
b) Draw the circuit diagram of SCR and explain its operation along with its characteristics. [7+8]
- 7.a) Draw and Explain BJT small signal model, compare the performance of CE, CB, CC amplifier.
b) Given $I_E = 2.5\text{mA}$, $h_{fe} = 140$, $h_{oe} = 20\mu\text{s}$ and $h_{ob} = 0.5\mu\text{s}$. Determine the common-emitter hybrid equivalent circuit. [8+7]
- 8.a) Explain the working of MOSFET amplifier and discuss the gain and frequency response characteristics?
b) An n-channel JFET has $I_{DSS} = 10\text{mA}$ and $V_P = -2\text{V}$. Determine the drain source resistance r_{ds} for (i) $V_{GS} = 0\text{V}$. (ii) $V_{GS} = -0.5\text{V}$. [8+7]

---ooOoo---