Code No.: EC301PC | R20 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–B.TECH–I–Semester End Examinations (Regular) - February- 2023
ELECTRONIC DEVICES AND CIRCUITS
(ECE)

[Time: 3 Hours] **[Max. Marks: 70]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 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 **(20 Marks)**

1. a) Define Static and Dynamic resistance levels of diode. [2M]
   b) Compare Drift and Diffusion currents of semiconductor. [2M]
   c) Define current amplification factors (α,β,γ). [2M]
   d) Explain how transistor acts as an Amplifier. [2M]
   e) Why the input impedance of FET is higher than BJT. [2M]
   f) Compare BJT and FET transistors. [2M]
   g) Draw BJT transistor small signal low frequency hybrid model. [2M]
   h) Define input impedance (Z_i) and output impedance (Z_o) of a transistor. [2M]
   i) Draw the H-Parameter model circuit for CB configuration. [2M]
   j) Define transconductance (g_m) and drain resistance(r_d) of a FET. [2M]

PART-B **(50 Marks)**

2. a) Draw and explain V-I characteristics of PN junction diode. [5M]
   b) Explain simple clipper and clamper circuits with circuit diagram. [5M]

OR

3. A Half wave rectifier has a load of 3.5 KΩ. If the diode resistance and the secondary coil resistance together have a resistance of 800Ω and the input voltage has a signal voltage of 240 V, calculate [10M]
   i) Peak, average and RMS value of current flowing.
   ii) DC power output.
   iii) AC power input
   iv) Efficiency of the rectifier.

4. a) Differentiate between NPN and PNP transistors. [5M]
   b) List out Few comparisons of CB, CE and CC configurations with examples. [5M]

OR

5. a) Draw the circuit diagram of a PNP junction transistor in CE configuration and describe its characteristics. [5M]
   b) Draw and explain the Fixed Bias Circuit. [5M]

6. a) Explain the construction and operation of N-channel JFET. [5M]
   b) Draw and explain the drain and transfer characteristics of N-channel JFET. [5M]

OR

7. Discuss the operation and characteristics of the following: [5M]
   a) SCR [5M]
   b) UJT

8. Draw and explain the H-Parameter equivalent circuit of a transistor in CC configuration. Derive the expressions for input impedance, output impedance and voltage gain. [10M]

OR

9. For a Common Emitter (CE) circuit draw the H-Parameter equivalent circuit and write the expressions for input impedance, output impedance and voltage gain. [10M]

10. Explain MOSFET characteristics in Enhance mode and Depletion mode. [10M]

OR

11. Draw the small signal equivalent circuit of JFET amplifier in CS connection and derive the equations for voltage gain, input impedance and output impedance. [10M]

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