**Code No.PC301EC**

**METHODIST COLLEGE OF ENGINEERING & TECHNOLOGY (An Autonomous Institution)**

**B.E. (ECE) III-Semester (AICTE) (Supplementary) Examination, Aug -2023**

**Subject: ELECTRONIC DEVICES**

**Time: 3 hours Max.Marks:60**

**Note: Missing data, if any, maybe suitably assumed.**

**PART-A**

**Answer All the questions.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q.No.** | **Questions** | **Marks** | **CO** | **BTL** |
| **1. a** | Define the term cut-in voltage .What is the cut-in voltage value for Germanium diode? | **2** | **1** | **2** |
| **b** | Determine ac resistance for a semiconductor diode having a forward bias of 200mV and reverse saturation current of 1 µA at room temperature? | **2** | **1** | **4** |
| **c** | Explain the terms ripple factor, efficiency and peak inverse voltage as referred to the full wave rectifier circuits? | **2** | **2** | **2** |
| **d** | What are the drawbacks of bridge rectifier over centre-tap rectifiers? | **2** | **2** | **2** |
| **e** | What is thermal runaway in transistor amplifier circuits? What is early effect in a BJT? | **2** | **3** | **2** |
| **f** | Distinguish between BJT & FET? Explain BJT as an amplifier? | **2** | **3** | **4** |
| **g** | Draw the equivalent h-parameter model for CE configuration? | **2** | **4** | **1** |
| **h** | Explain how you will obtain graphically hybrid parameters of a transistor? | **2** | **4** | **2** |
| **i** | Why FET is known as the unipolar device? | **2** | **5** | **1** |
| **j** | List the advantages of MOSFET over JFET? | **2** | **5** | **2** |

**PTO**

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**PART-B**

**Answer Any Five questions**.

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| **Q.No.** |  | **Questions** | **Marks** | **CO** | **BTL** |
| **2.** | **a** | Explain the current components of p-n junction diode and deduce the expression for the current in a diode due to a voltage applied? | **5** | **1** | **4** |
| **b** | The voltage across a silicon diode at room temperature of 300oK is 0.7V when 2mA current flows through it. If the voltage increases to 0.77V, calculate the diode current. Assume VT=26mV | **3** |  |  |
| **3.** | **a** | Explain the operation of the half wave rectifier with necessary diagrams and waveforms? | **4** | **2** | **4** |
| **b** | A sinusoidal voltage of 40V and frequency 50Hz is applied to a half wave rectifier, RL=200ohm,Vγ=0,Rf=20ohm Find Vdc , Idc, Imax , Irms, Pdc, ripple factor ,η? | **4** |  |  |
| **4.** | **a** | Explain operation of common base configuration of BJT to obtain input and output characteristics? | **5** | **3** | **2** |
| **b** | What is thermal runaway in BJT? How can it be addressed? | **3** |  |  |
| **5.** |  | Draw the circuit diagram of CE amplifier with emitter resistance and derive the expression for AI, AV, Ri and Ro using hybrid model. | **8** | **4** | **4** |
|  |  |  |  |  |
| **6.** | **a** | Define various FET parameters and obtain the relationship between them? | **3** | **5** | **3** |
| **b** | Explain the operation of a MOSFET in enhancement mode? | **5** |  |  |
| **7.** | **a** | Compare Zener and avalanche breakdowns? | **4** | **1** | **4** |
| **b** | Explain the operation of the full wave rectifier with necessary diagrams and waveforms? | **4** | **2** | **4** |
| **8.** | **a** | Draw the circuit of self -biased CE amplifier using diode compensation for VBE. Describe how bias compensation is achieved. | **5** | **3** | **4** |
| **b** | Draw small signal h-parameter model for CB configuration. | **3** | **4** | **2** |
| **9.** | **a** | Compare BJT versus JFET? | **4** | **5** | **4** |
| **b** | Compare Half wave, Full wave and bridge rectifiers. | **4** | **1** | **2** |

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