**Code No.PC406EC**

**METHODIST COLLEGE OF ENGINEERING & TECHNOLOGY**

**(An Autonomous Institution)**

**B.E. (ECE) IV-Semester (Supplementary) Examination, FEB-2024**

**Subject: ANALOG ELECTRONIC CIRCUITS**

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

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

**PART-A**

**Answer All the questions. (10X2M=20M)**

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| --- | --- | --- | --- | --- |
| **Q.No.** | **Questions** | **Marks** | **CO** | **BTL** |
| **1. a** | Why h-parameter model is not valid at high frequencies? | **2** | **1** | **1** |
| **b** | Define *f*T and find its value using the typical values of hfe=50, and fβ= 10MHz | **2** | **1** | **1** |
| **c** | Gain and bandwidth of an amplifier are 40dB and 200 KHz. If three such stages are cascaded then solve for the overall gain and bandwidth? | **2** | **2** | **3** |
| **d** | What is a Cascode amplifier? Where it is used? | **2** | **2** | **1** |
| **e** | List the advantages of negative feedback in amplifiers? | **2** | **3** | **1** |
| **f** | An amplifier has an Open Loop Voltage gain of 1000 and a feedback ratio of  0.04.If the open loop gain changes by 10% due to temperature; solve for the %  change in gain of the amplifier with feedback. | **2** | **3** | **3** |
| **g** | Why LC oscillators are not preferred to generate low frequency signals? | **2** | **4** | **1** |
| **h** | Find the operating frequency of a Hartley Oscillator if L1 = 50mH, L2 = 30mH and C= 10µf. | **2** | **4** | **1** |
| **i**  **j** | Classify the Power amplifiers?  Compare Large signal and Small signal amplifiers | **2**  **2** | **5**  **5** | **2**  **2** |

**P.T.O**

**PART-B**

**Answer Any Five questions**. **(5X8M=40M)**

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| --- | --- | --- | --- | --- | --- |
| **Q.No.** |  | **Questions** | **Marks** | **CO** | **BTL** |
| **2.** | **a** | Draw and explain the significance of each component of hybrid-π model | **4** | **1** | **3** |
| **b** | Derive the expressions for Transistor Hybrid- π parameters  and in terms of its h-parameters | **4** | **1** | **3** |
| **3.** | **a** | Analyze two stage RC coupled CE amplifier for voltage gain AV in low and mid frequency regions. Also derive lower cutoff frequency. | **5** | **2** | **4** |
| **b** | Obtain the expression for overall higher cutoff frequency of n-stage cascaded amplifier | **3** | **2** | **3** |
| **4.** | **a** | Explain working of RC Phase shift oscillator and obtain frequency of oscillations. | **8** | **3** | **3** |
|  |  |  |  |  |
| **5.** | **a** | Explain the working of a Colpitts Oscillator and obtain the expressions for condition of sustained oscillations and frequency of oscillations. | **8** | **4** | **3** |
|  |  |  |  |  |
| **6.** | **a** | Prove that the maximum power dissipation in class-B power amplifier is 40% of its maximum ac output power. | **5** | **5** | **3** |
| **b** | Explain about class-AB power amplifier | **3** | **5** | **2** |
| **7.** | **a** | Evaluate the effect of Coupling Capacitor on the low frequency response of a Single Stage BJT CE amplifier. | **4** | **1** | **3** |
| **b** | Discuss about various coupling schemes used in amplifiers. | **4** | **2** | **3** |
| **8.** | **a** | Sketch the block diagrams of four feedback topologies | **4** | **3** | **3** |
| **b** | Explain the working of Crystal oscillator | **4** | **4** | **2** |
| **9.** | **a** | Prove that push-pull configuration eliminates even harmonics in the output of a power amplifier. | **4** | **5** | **3** |
| **b** | Discuss with relevant derivations the effect of negative feedback on  of Current amplifier. | **4** | **3** | **3** |

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