**Code No.PC409EC**

**METHODIST COLLEGE OF ENGINEERING & TECHNOLOGY**

**(An Autonomous Institution)**

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

**Subject: INTEGRATED CIRCUITS AND APPLICATIONS**

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

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

**PART-A**

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q.No.** |  **Questions** | **Marks** | **CO** | **BTL** |
| **1. a** | What are the different types of ICs | **2** | **1** | **I** |
| **b** | Define PSRR, CMRR  | **2** | **1** | **I** |
| **c** | Derive the gain of inverting OPAmp | **2** | **2** | **II** |
| d | What are the advantages of active filters over passive filters | **2** | **2** | **III** |
| **e** | List the applications of 555 timer | **2** | **3** | **I** |
| **f** | Explain the characteristics of 3 terminal voltage regulators | **2** | **3** | **II** |
| **g** | Mention the advantages and disadvantages of Successive approximation type ADC | **2** | **5** | **II** |
| **h** | Specify guaranteed input and output voltage ranges of TTL IC | **2** | **4** | **I** |
| **i****j** | Design a 2 : 4 DecoderCompare synchronous and asynchronous counters  | **2****2** | **6****6** | **III****II** |

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**PART-B**

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

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| --- | --- | --- | --- | --- | --- |
| **Q.No.** |  | **Questions** | **Marks** | **CO** | **BTL** |
| **2.** | **a** | Evaluate the voltage gain of single input unbalanced output differential amplifier | **4** | **1** | **V** |
| **b** | Explain DC characteristics of an OPAMP | **4** | **1** | **II** |
| **3.** | **a** | Prove that OPAMP can be used as Voltage to current Converter  | **4** | **2** | **V** |
| **b** | Design a wide band pass filter fl=400Hz,fh=2KHz and pass band gain of 4. Find Q of the filter  | **4** | **2** | **III** |
| **4.** | **a** | Determine the Astable mode of operation of IC 555 timer? Derive the expression for frequency of oscillation  | **4** | **3** | **V** |
| **b** | Explain the block diagram of PLL and the function of each block | 4 | **3** | **II** |
| **5.** | **a** | Explain the operation of tristate logic circuit with neat sketch | **4** | **4** | **V** |
| **b** | Explain the operation of Inverted R-2R ladder DAC  | **4** | **5** | **III** |
| **6.** | **a** | Explain the operation of Serial Binary Adder  | **4** | **6** | **II** |
| **b** | Build a 3bit Asynchronous counter using JK flip flops. | **4** | **6** | **VI** |
| **7.** | **a** | Explain the block diagram of an OPAMP | **4** | **1** | **I** |
| **b** | Explain the operation of Summing amplifier using OPAMP | **4** | **2** | **III** |
| **8.** | **a** | Explain the working of IC 723 as high voltage regulator | **4** | **3** | **III** |
| **b** | Compare TTL and CMOS logic family | **4** | **4** | **II** |
| **9.** | **a** | Design a 2 bit magnitude comparator | **4** | **6** | **IV** |
| **b** | Explain the functional block diagram of 555 timer | **4** | **3** | **II** |

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