**20EC501**

**Hall Ticket Number:**

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| **III/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
| **December, 2023** | **Electronics and Communications Engineering** | | |
| **Fifth Semester** | **Linear Integrated Circuits** | | |
| **Time:** Three Hours | | **Maximum:** 70 Marks | |
| ***Answer question 1 compulsory.*** | | | **(14X1 = 14Marks)** |
| ***Answer one question from each unit.*** | | | **(4X14=56 Marks)** |
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|  |  |  | CO | BL | M |
| 1 | a) | What are the ideal characteristics of op-amp? | CO1 | L1 | 1M |
|  | b) | Define common mode rejection ratio. | CO1 | L1 | 1M |
|  | c) | What is resolution in a converter? | CO3 | L1 | 1M |
|  | d) | List the important characteristics of Op-Amp as comparator | CO3 | L1 | 1M |
|  | e) | Explain what is PSRR? | CO2 | L1 | 1M |
|  | f) | What is off-set voltage? | CO2 | L1 | 1M |
|  | g) | Define filter and draw response of a LPF. | CO3 | L1 | 1M |
|  | h) | The DC open loop gain of an op-amp is 100,000. What will be open loop gain at its break frequency? | CO2 | L2 | 1M |
|  | i) | What is unity gain bandwidth? | CO1 | L1 | 1M |
|  | j) | What is basic principle of Oscillators? | CO2 | L2 | 1M |
|  | k) | What is Current limiting in voltage regulator. | CO4 | L2 | 1M |
|  | l) | What are the sections in IC 723. | CO4 | L1 | 1M |
|  | m) | What is all pass filter? | CO4 | L1 | 1M |
|  | n) | What is capture range? | CO4 | L1 | 1M |
| **Unit-I** | | | | | |
| 2 | a) | List and explain the function of all basic building blocks of an Op-amp. | CO1 | L2 | 7M |
|  | b) | Derive for gain, input and output resistance of an op-amp with Voltage series feedback amplifier. | CO1 | L2 | 7M |
| **(OR)** | | | | | |
| 3 | a) | Draw a basic integrator circuit. Explain the requirement of a practical op-amp integrator with its frequency responses. | CO1 | L3 | 7M |
|  | b) | Discuss about voltage to current conversion using Op-amp | CO1 | L2 | 7M |
| **Unit-II** | | | | | |
| 4 | a) | Draw and explain the generation of oscillations in RC phase shift Oscillator using Op-amp. | CO2 | L2 | 7M |
|  | b) | Draw the voltage limiters using op-amp and explain the need for them. | CO2 | L2 | 7M |
| **(OR)** | | | | | |
| 5 | a) | Design an op-amp Schmitt trigger for given UTP = 2V and LTP= -2V. | CO2 | L4 | 7M |
|  | b) | What is a voltage Limiter? Explain the operation of voltage limiters of two levels. | CO2 | L2 | 7M |
| **Unit-III** | | | | | |
| 6 | a) | Which type of ADC is fastest and explain clearly why? | CO3 | L3 | 7M |
|  | b) | Explain the operation of an op-amp circuit as peak detector. | CO3 | L2 | 7M |
| **(OR)** | | | | | |
| 7 | a) | Explain the operation of dual slope conversion type of ADC. What is the advantage with this conversion method? | CO3 | L2 | 7M |
|  | b) | Draw and explain a negative clipper and positive clamper using op-amp. | CO3 | L3 | 7M |
| **Unit-IV** | | | | | |
| 8 | a) | Draw the block schematic of IC 555 in monostable mode of operation. Explain its operation, also derive for the pulse width of the output. | CO4 | L3 | 7M |
|  | b) | Explain the design of a wide bandpass filter with given band width and mid band gain. | CO4 | L2 | 7M |
| **(OR)** | | | | | |
| 9 | a) | Explain the operation of IC 565 PLL with block schematic. | CO4 | L2 | 7M |
|  | b) | Derive the trans function of a sallenkey prototype filter. | CO4 | L2 | 7M |

