**20EI502**

**Hall Ticket Number:**

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| **III/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **February,2023** | **Electronics & Instrumentation Engineering** | | |
| **Fifth Semester** | **Linear integrated Circuits & Applications** | | |
| **Time:** Three Hours | | **Maximum: 7**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (14X1 = 14 Marks) |
| *Answer* ***ANY ONE*** *question from each Unit.* | | | (4X14=56 Marks) |

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| 1. | a) | Define CMRR. | CO1 | L1 | 1M |
|  | b) | Draw the block diagram of operational amplifier. | CO1 | L1 | 1M |
|  | c) | Calculate the voltage gain of non-inverting operational amplifier if Rf=10K and R1=2k. | CO1 | L3 | 1M |
|  | d) | List the advantages of precision diode. | CO2 | L2 | 1M |
|  | e) | What are the applications of comparator? | CO2 | L1 | 1M |
|  | f) | Explain the barkhausen criterion for oscillations. | CO2 | L2 | 1M |
|  | g) | Draw the circuit of voltage follower. | CO3 | L2 | 1M |
|  | h) | Define resolution of a converter. | CO3 | L1 | 1M |
|  | i) | Define settling time of the converter. | CO3 | L1 | 1M |
|  | j) | Draw the CMOS inverter SPDT switch. | CO3 | L2 | 1M |
|  | k) | List the applications of Monostable multivibrator. | CO4 | L1 | 1M |
|  | l) | Draw the pin diagram of 555 timer. | CO4 | L2 | 1M |
|  | m) | Define lock-in range and capture range of PLL | CO4 | L1 | 1M |
|  | n) | A wide band pass filter has fl=400Hz and fh=2kHz and center frequency 1.6 KHz. Find **Q** | CO4 | L3 | 1M |
| **Unit -I** | | | | | |
| 2. | a) | Explain about dominant pole compensation technique with necessary equations, circuit diagram and gain vs frequency curve. | CO1 | L2 | 7M |
|  | b) | Explain the operation of inverting summing amplifier with necessary diagrams and equations. | CO1 | L3 | 7M |
|  |  | **(OR)** |  |  |  |
| 3. | a) | What is the drawback of ideal integrator and explain how practical integrator overcomes the drawback with necessary circuit diagrams and equations. | CO1 | L3 | 7M |
|  | b) | Draw the circuit diagram for Instrumentation Amplifier and Explain. | CO1 | L1 | 7M |
|  |  | **Unit -II** |  |  |  |
| 4. | a) | Construct wein bridge oscillator using op amp and derive its resonant frequency. | CO2 | L3 | 7M |
|  | b) | Design a square wave oscillator using operational amplifier at f=1kHz and supply voltage of +12V and -12V. | CO2 | L4 | 7M |
|  |  | **(OR)** |  |  |  |
| 5. | a) | Draw the triangular wave generator using less number of components, explain its working, and sketch the waveforms. | CO2 | L2 | 7M |
|  | b) | Explain about zero crossing detector with circuit and waveforms | CO2 | L2 | 7M |
|  |  | **Unit -III** | |  |  |
| 6. | a) | Draw the negative clipper circuit using operational amplifier and explain with necessary waveforms. | CO3 | L2 | 7M |
|  | b) | Draw the circuit of a R-2R ladder type DAC with 3 bits and derive the expression for the analog output. | CO3 | L2 | 7M |
|  |  | **(OR)** |  |  |  |
| 7. | a) | Draw the positive clipper circuit using operational amplifier and explain with necessary waveforms. | CO3 | L2 | 7M |
|  | b) | Explain the working principle of dual slope ADC and obtain the expression for the output. | CO3 | L2 | 7M |
|  |  | **Unit -IV** |  |  |  |
| 8. | a) | Explain the operation of an Astable multivibrator using 555 timer. Derive the expression for time period. | CO4 | L2 | 7M |
|  | b) | Design a first order low pass filter with cutoff frequency of 1KHz and pass band gain of 11. Also draw its frequency response. | CO4 | L1 | 7M |
|  |  | **(OR)** |  |  |  |
| 9. | a) | Draw the block diagram of PLL and derive the expression for capture range. | CO4 | L2 | 7M |
|  | b) | Derive the frequency response of 2nd order LPF with a neat sketch | CO4 | L3 | 7M |

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