Paper / Subject Code: 40823 / Linear Integrated Circuits

1T01034 - S.E.(Electronics and Telecommunication)(SEM-IV)(Choice Base Credit Grading System) (R-20-21) (C Scheme) / 40823 - Linear Integrated Circuits

QP CODE: 10015232   DATE: 14/12/2022

Time: 3 hours   Max. Marks: 80

Instructions:
- Question No. 1 is compulsory
- Solve any 3 questions from the remaining 5
- Figures to the right indicate full marks
- Assume suitable data if necessary and mention the same in the answer sheet

		Marks
Q1.	**Attempt any 4**	
a)	List the ideal characteristics of Operational amplifier and give the practical values of Op-Amp IC 741.	5
b)	Draw a neat circuit diagram for voltage to current converter with grounded load Derive its output current expression.	5
c)	Differentiate between Inverting and Non-Inverting Comparator.	5
d)	Explain the functional block diagram of Timer IC 555.	5
e)	With the help of a functional block diagram explain the working of a Three terminal fixed voltage regulator.	5
f)	Draw the block diagram of Voltage Controlled Oscillator and explain its working.	5
Q2a)	Draw a neat circuit of an instrumentation amplifier using 3-Op-Amps & derive its output equation.	10
Q2b)	What are the limitations of an ideal differentiator using op-amp? Draw the circuit diagram of a practical differentiator and explain how it overcomes the limitations.	10
Q3a)	With help of neat circuit diagram and voltage transfer characteristics explain the working of a non-inverting Schmitt trigger.	10
Q3b)	Design an astable multivibrator having an output frequency of 1 kHz with a duty cycle of 50% using IC 555. Assume C = 0.01µF.	10
Q4a)	Design a voltage regulator using 723 to deliver an output voltage of 15 V and load current up to 50 mA.	10
Q4b)	Draw the functional block diagram of IC 565 and explain its application as FSK demodulator.	10
Q5a)	Draw a neat circuit diagram of an inverting summing amplifier using op-amp to obtain the expression for its output voltage as $V_O = -(V_1+V_2+V_3)$, where V_1, V_2, V_3 are input voltages.	10
Q5b)	With the help of a neat diagram explain the working of Wein bridge oscillator using op amp. Derive the expression for its frequency of oscillation. What are the values of R & C if its frequency of oscillation is 5 kHz?	10
Q6a)	With the help of a neat diagram and wave forms at appropriate points in the circuit explain the working of square and triangular waveform generator using op amps.	10
Q6b)	What is Pulse Width Modulation? With the help of a neat circuit diagram and waveforms at trigger input, control voltage pin, across the timing capacitor and at the output, explain the working of IC 555 as Pulse Width Modulator.	10