K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

~~Nov – Dec 2024~~
Supplementary **(B. Tech) Program :**EXTC **Scheme:** III
~~Regular~~ **Examination:** SY **Semester:** III
Course Code: EXC303 **Course Name:** Electronic Devices and Linear IC's_
Date of Exam: 29-01-25 **Duration: 02.5 Hours** **Max. Marks: 60**

EXC303

Instructions:
(1)All questions are compulsory.
(2)Draw neat diagrams wherever applicable.
(3)Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any **two** questions out of three: (05 marks each)	10		
a)	Explain the construction and working of enhancement type MOSFET.		CO1	Un
b)	Design the circuit for Vo=V1+V2 using single op-amp and few resistors		CO2	Un
c)	Describe the circuit operations of V to I converters with grounded load and derive the expression for the output current		CO3	Ap
Q 2	Solve any **two** questions out of three: (05 marks each)	10		
a)	With the neat circuit diagram explains the working of the comparator circuit.		CO4	Un
b)	Draw block diagram of voltage-controlled oscillator explain its operation.		CO6	Un
c)	Design the astable multivibrator using IC 555 to provide output square wave with frequency of 5 KHz, or duty cycle of a)75% b)50%		CO5	Ap
Q.3	Solve any **two** questions out of three. (10 marks each)	20		
a)	Explain the need of biasing. Describe different biasing methods of the transistor. Comment on the efficiency of the biasing circuits based on the stability factor.		CO1	Un
b)	Design the circuit for Vo=V1+V2 using single op-amp and few resistors. Draw the voltage follower circuit using op-amp and show that its gain is unity.		CO2	Un

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	Draw the circuit diagram of I to V converter using op-map. Explain its operation with suitable waveforms and circuit diagram.			
c)	i)Design the Wein Bridge oscillator to calculate the value for Rf that will yield A = 3 when R1 = 1k. ii) Calculate the value of R for an oscillation frequency of 1.5 kHz when C = 0.01μF		CO3	Ap
Q.4	Solve any **two** questions out of three. (10 marks each)	20		
a)	Design an inverting Schmitt trigger with following specifications V_{UTP} =+3V, V_{LTP}=-1V, for Vo=20sin wt with Vsat=+-12V.Draw output waveforms and transfer characteristics		CO4	Ap
b)	Calculate the maximum distorted amplitude that a sine wave input of 10 kHz, can produce at the output of an op-amp whose slew-rate is 0.5v/μsec		CO5	AP
c)	.Derive an equations and discuss the working of Half wave Precision Rectifier.		CO2	Un

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