



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

	InSem Examination-IWinter 2023		
	Exam Seat No.:		
	Academic Year:2023-2024	Semester:III	
	Name of Programme: S.Y.B.Tech Electrical Engineering	Pattern:2022	
	Name of Course:Analog and Digital Circuits	Course Code:ELE222002	
	Max. Marks:30	Duration:1 hour	

	<p>Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.</p> <ol style="list-style-type: none">1. This question paper contains 02 pages.2. Answer to each new question is to be started on a new page.3. Assume suitable data wherever required, but justify it.4. Draw the neat labelled diagrams, wherever necessary.5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question	
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Question No. 1 Attempt following Question

- a) Give Ideal and Practical Characteristics of OPAMP with values (4) CO2

OR

- b) Draw block diagram of instrumentation amplifier and give its 3 characteristics with the practical values. (4) CO2
- c) Draw and Explain open loop configuration of OPAMP in Inverting mode with Positive reference voltage $V_{ref}=1V$ and $V_{in}=5V_{pp}$, $+V_{CC}=13V$, $-V_{CC}=13V$ (5) CO2

OR

- d) Draw and explain types of active filters with its frequency responses (5) CO2

- e) Draw the integrator using OPAMP and derive the output voltage. (6) CO2

OR

- f) Draw circuit diagram, waveforms explain non-inverting zero crossing detector using OPAMP. (6) CO2

Question No. 2 Attempt following Question

- a) A first order active high pass filter has a pass band gain of 2 and a cut-off corner frequency of 1kHz. If the input capacitor has a value of 10nF, calculate all other parameters. (6) CO4

OR

- b) In a 3 OPAMP instrumentation amplifier is having output voltage 3.7V, Input voltage is 100 mV. Determine the gain of the amplifier and feedback resistance is to be connected in circuit if $R_1=100\ \Omega$. (6) CO4

- c) Determine maximum and minimum frequency of oscillations of a wein bridge oscillator circuit having a resistor of 10 kohm and a variable capacitor of 1nF to 100nF. (5) CO4

OR

- d) Design a square wave generator so that $f_0=1\text{kHz}$ using IC741 with $V_{cc}=+15\text{V}$, - $V_{cc}=-15\text{V}$. Assume $R_1=10\ \text{k}\Omega$ and $C=0.5\ \mu\text{F}$. (5) CO4

- e) Draw and explain peak detector using OPAMP. (4) CO2

OR

- f) Draw a circuit diagram of square wave input and Triangular wave output. Which component is to be added in triangular wave generator to convert it in to saw tooth wave form generator? (4) CO2