



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

In Sem Examination-I Winter2024	
Exam Seat No.:	
Academic Year: 2024-2025	Semester: III
Class: SY	Program: B. Tech
Branch Code: ELE	Pattern: 2023
Name of Course: Analog and Digital Circuits	Course Code: 2306206
Max. Marks: 30	Duration: 1.15 Hrs.

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.

1. This question paper contains 2 page(s).
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. Question 1 and Question 3 are compulsory.

Marks CO

Question No. 1

- 1 a) List out the ideal characteristics of OPAMP? Define CMRR of an op-amp. (3) CO2
- 1 b) Draw circuit diagram and waveform of Inverting and Non inverting Comparator. (4) CO2

Question No. 2

- 2 a) With the help of Hysteresis characteristics, explain the working of Schmitt trigger circuit (Inverting). (4) CO2
- 2 b) An inverting amplifier has $R_1=20\text{ k}\Omega$ and $R_f=100\text{ k}\Omega$. Find the output voltage and the input current for an input voltage of 1V. Draw the circuit diagram (4) CO4

OR

- 2 c) Explain and Derive the application of OPAMP as a differentiator. (4) CO2
- 2 d) Figure 1 shows all values, Determine the output voltage of the differential amplifier (4) CO4

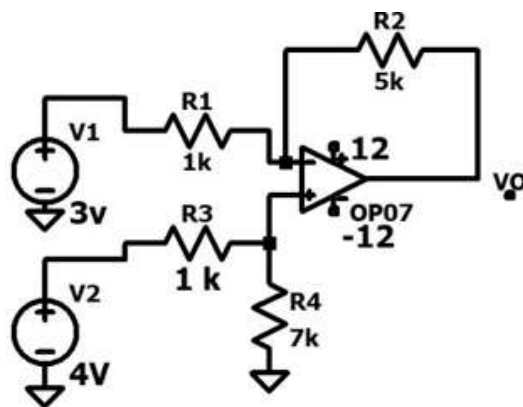


Figure 1

Question No. 3

- 3 a) Draw and Explain the Peak Detector. (3) CO2
- 3 b) Explain the Instrumentation Amplifier using a neat circuit diagram (4) CO2

Question No. 4

- 4 a) Draw and explain the Wein bridge oscillator. Why the oscillator is called lead lag? (4) CO2
- 4 b) Design a V to I converter with grounded load with $V_{in}=5V$, $V_1=1V$, $R=10K\Omega$. Calculate V_{out} and Load current. Draw circuit Diagram (4) CO4

OR

- 4 c) Draw and explain the triangular generator. Draw the suitable waveform (4) CO2
- 4 d) Design a RC Phase shift Oscillator so that $f_0=10\text{ kHz}$. Assume suitable R_1 . $C=0.1\mu F$ and $R_f=29R_1$. Calculate R , R_f and draw circuit diagram. (4) CO4

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