

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	i. A low-pass filter be used in an image processing application to remove _____ frequency noise. ii. The circuits of an inverting and Non-Inverting amplifying comprises of _____ and _____ number of resistors. iii. Which amplifier is called voltage follower? iv. Which is better inverting or non-inverting amplifier? Why? v. An ideal integrator acts as an _____ (low pass/high pass) filter?	CO5	5
Q2	i. For an operational amplifier circuit (shown in Fig 1), find the output voltage for the given input voltages. ii. In Fig 2, $R_1=10k\Omega$, $R_F=100k\Omega$, $v_1=1V$. A load of $25k\Omega$ is connected to the output terminal. Calculate i_1 and v_o .	CO1	2 + 2
Q3	i. Sita is working on her minor project. She wants to design different types of closed loop amplifier circuits for which she require input voltage. Now, she is bit confused which type of input to considered; AC or DC? The question comes in her mind : can op amp amplify both AC and DC? Reply to her question. Also, design one circuit for each amplifier. ii. Calculate the value of the current I flowing through resistance R in the operational amplifier circuit shown in Fig. 3	CO1	2 + 2
Q4	i. Shyam wants to perform arithmetic operations using operational amplifier. Help him in designing any 2 circuits. ii. Mention two linear and two non-linear applications performed by an operational amplifier. Design any one	CO2	2 + 2

	application of both.		
Q5	i. Angel is working in laboratory and wants to check whether the diode, zener diode or LED is working or not. Help her in designing the circuit using op-amp. ii. What determines the peak frequency (f_p) in the peaking amplifier?	CO2	2 + 2
Q6	i. Why are high-pass filters used in audio equalizers to remove low-frequency rumble? ii. Determine the type (LP, HP, BP, BS) and cutoff frequency of the active filter shown in Fig 4.	CO4	2 + 2

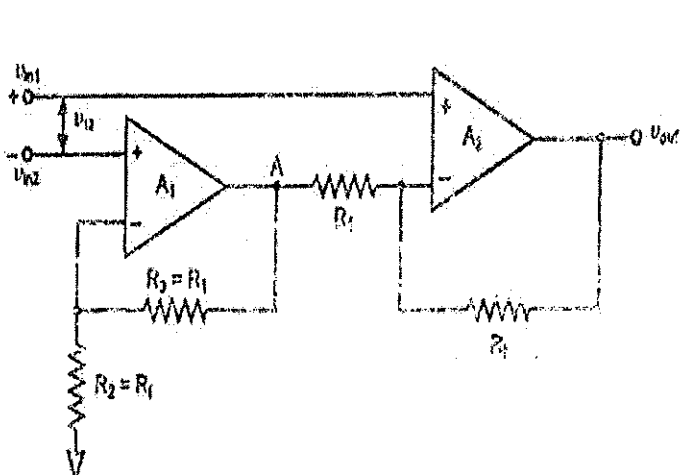


Fig 1

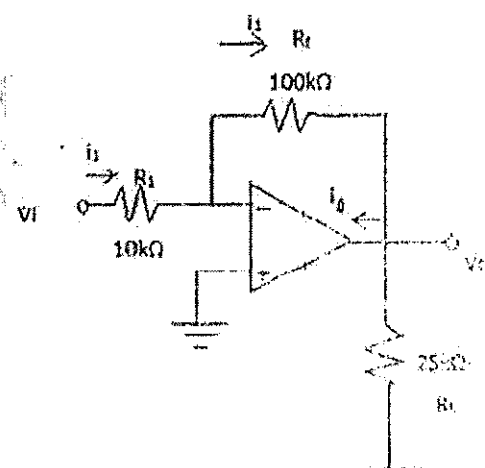


Fig 2

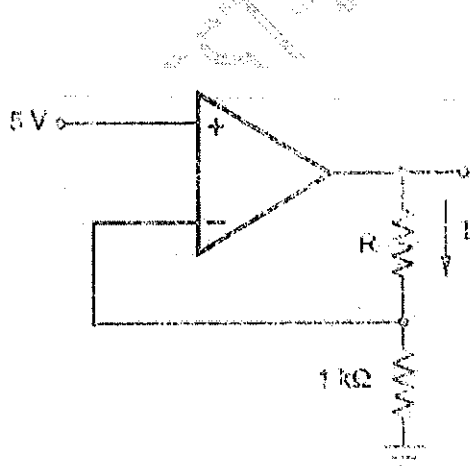


Fig 3

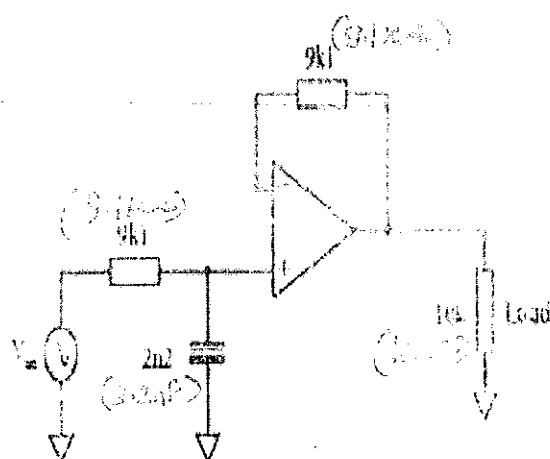


Fig 4