

6. Identify and describe configuration of the circuit which is basically an comparator with positive feedback. The purpose of the circuit is to convert any irregular shape wave form into square wave .thus it is also known as Square Wave generator.

(CO4) [Knowledge]

7. In the Mono stable multi vibrator $R=100\text{kohms}$ and time delay is $T=100\text{msec}$ Identify the value of Capacitance C ?

(CO3) [Knowledge]

Part - B

Answer any 4 questions

4Q x 10M = 40M

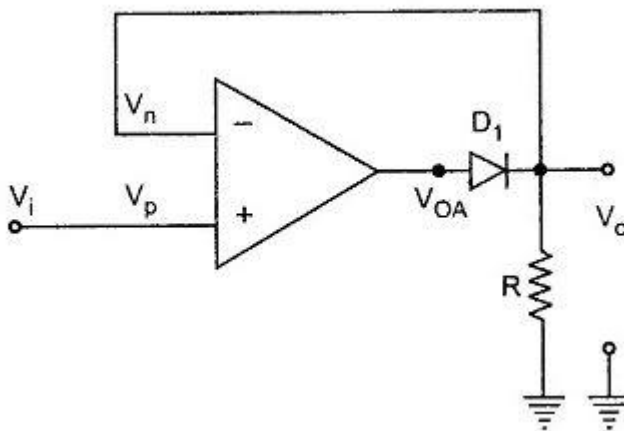
8. An operational amplifier is a DC-coupled high-gain electronic voltage amplifier with a differential input and, usually, a single-ended output. Write any three linear and non linear applications of op – amps.

(CO3) [Comprehension]

9. Mr. Kishan wants to operate a load (motor) which needs an input voltage range of -1.2 V to -57 V DC supply. He don't want to use a power converter system to get the voltage range as stated. Is there any other way through which he can get the required voltage range. If yes/No explain the method with necessary conditions.

(CO2) [Comprehension]

10. Identify the circuit shown below, also Draw the output waveform for the same.



(CO3) [Comprehension]

11. Mr. Harsh is looking to upgrade the sound system in his car by reducing the likelihood of interference from sources like low frequency noise signals. Mr. Harsh comes and approaches you regarding the suitable circuit for attenuating the high frequency Signals. Suggest him a suitable circuit with clear explanation. explain filter circuit which has a constant gain from 0 Hz to a high cutoff frequency f_L , with a gain fall off rate in stop band of 20dB/decade .

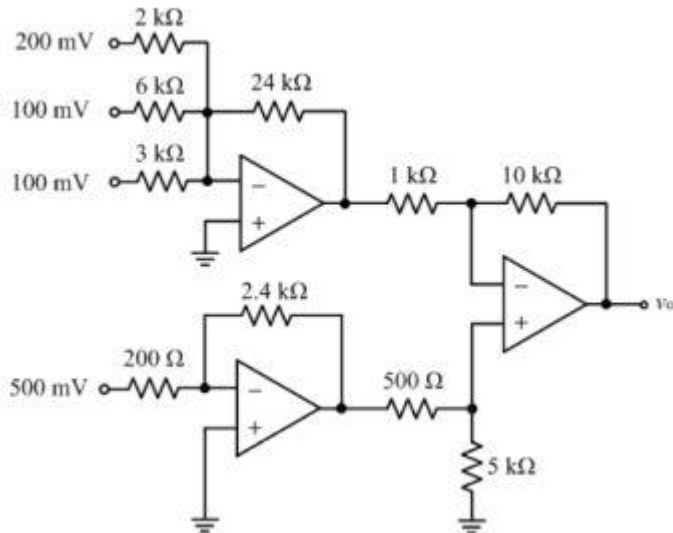
(CO2) [Comprehension]

12. The 555 timer IC is an integrated circuit used in a variety of timer, delay, pulse generation, and oscillator applications .Identify the 555 timer circuit which has one stable state and explain it with neat waveform.

(CO3) [Comprehension]

13. What is the output at each stage of the op-amps shown in figure below? The op-amps are connected to $\pm 15V$, and has a saturation of $V_{sat} = |V_{cc}-2|$. Assume inputs are dc signals.

(CO2) [Comprehension]



Part - C

Answer any 2 questions

2 x 20M = 40M

14. For the 555 Astable multivibrator $R_A = 50K \text{ ohm}$, $R_B = 1K \text{ ohm}$ & $C = 0.01 \mu F$ Determine :
 i) charging pulse width T_c ii) the discharging pulse width T_d iii) Free running frequency 'f'
 iv) duty cycle

(CO4) [Application]

15. Microprocessor-controlled circuits, Arduinos, Raspberry Pis, and other similar digital logic circuits may connect with the outside world by means of analogue-to-digital converters, or ADCs. Explain a method of analog to digital conversion which uses a successive approximation register in the design for given analog input $V_i = 1.78V$ and illustrate the conversion of an ADC

(CO4) [Application]

16. Identify the Analog to Converter which converts analog to digital signal in no time. With neat supporting diagram explain a method of analog to digital conversion

(CO4) [Application]