Seat No. _____

HAJ-003-1153003

M. Sc. (Sem.-III) Examination

May - 2023

Electronics : Paper-11

(OP AMP & Its Application)

Faculty Code : 003

Subject Code : 1153003

Time : $2\frac{1}{2}$ Hours / Total Marks : **70**

1 Answer the following: (Any 7 out of 10) **14**

(1) Enlist the Ideal characteristics of an Op Amp.

(2) Differentiate between Harmonic oscillators and Relaxation oscillators.

(3) Draw the pin diagram of LM741.

(4) List the advantages of an integrated circuit.

(5) Show the classification of ICs based on Applications.

(6) Differentiate between- Positive and negative feedback.

(7) Explain Barkhausen criteria for oscillation.

(8) What is Quadrature oscillator? Explain in brief.

(9) For inverting op amp, if the circuit has R_1 = 1k Ω , R_f= 100 k Ω and V_{in} = 20mV, Calculate its output voltage and gain.

(10) Explain Different working' mode of IC 555 in brief.

2 Answer the following: (Any 2 out of 3) **14**

(1) Draw the basic block diagram. of an Op Amp and explain each block in detail.

(2) Write detailed note on voltage series feedback.

(3) How can we use Op amp as voltage to Current converter? Show its applications. (at least 3)

3 Answer the following: **14**

(1) Write a note on RC phase shift oscillator. Design it for f_o = 250 Hz.

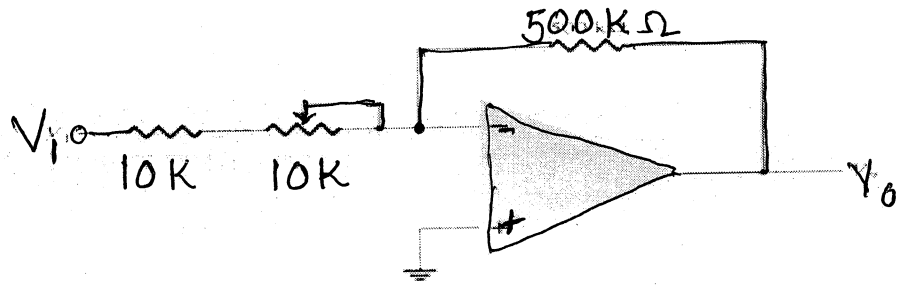
(2) Draw the circuit and explain First order high pass filter.

Design first order low pass filter at a cutoff frequency of 1 kHz with `a pass band gain of 2.

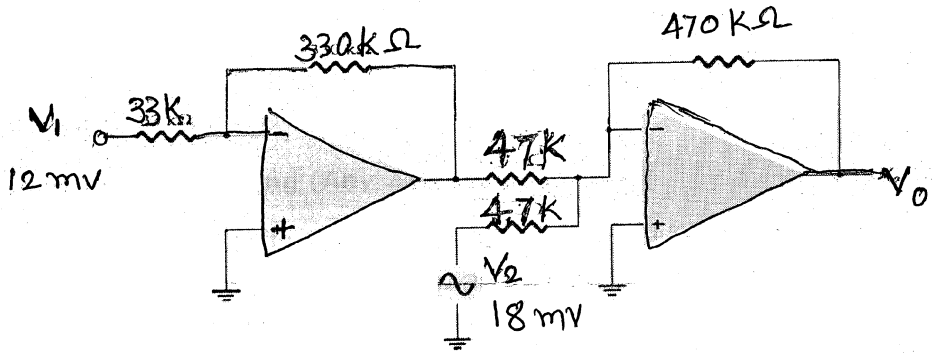
OR

3 Answer the following: **14**

(1) What is the output voltaae range if V1= 40 mV ?



(2) Calculate the output voltage.



4 Answer the following: **14**

(1) Draw proper diagram and explain Astable mode of IC 555.

Determine the value of capacitor C needed using RA = RB = 7.5 k Ω for operation at 350 kHz.

(2) Show OP Amp as summing, Scaling and averaging amplifier in Inverting mode.

5 Answer the following: (Any 2 out of 4) **14**

(1) Discuss DC offset: parameters of an OP AMP in the closed loop.

(2) Show how we use OP Amp as an integrator? Explain its modification for practical use.

(3) Discuss transducer bridge instrumentation amplifier and derive its output voltage.

(4) Explain any ONE application of LM565 in detail with necessary circuit.
