22433

24225

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **10**

a) Draw single input balanced output configuration of differential amplifier.

b) State virtual ground concept of op-amp.

c) Identify the type of filter for given frequency response characteristics. shown in Fig. No. 1.

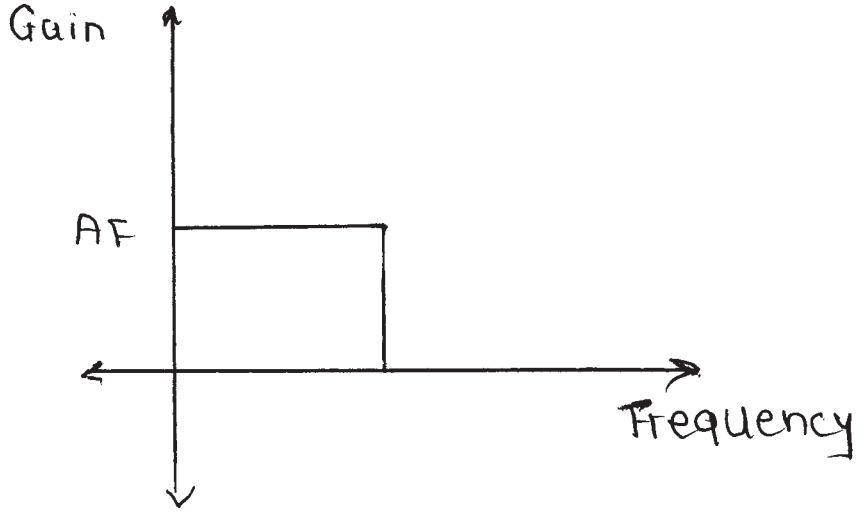

Fig. No. 1

P.T.O.

Marks

d) Draw the pin diagram of IC 555.

e) Define –

i) Roll off rate

ii) Cut off frequency

f) List linear and non linear op-amp circuit.

g) Draw the V to I converter with grounded load using op-amp.

2. Attempt any <u>THREE</u> of the following : **12**

a) State four application of instrumentation amplifier.

b) If R_1 = 2KΩ, R_F = 100 KΩ, V_{CC} = + 15V and rms input voltage V_i = 50mV calculate output voltage in inverting and non-inverting mode.

c) Draw the first order low pass butterworth filter with frequency response. Give the expression for cut off frequency of filter.

d) Differentiate between integrator and differentiator.

3. Attempt any <u>THREE</u> of the following : **12**

a) Draw ideal and practical transfer characteristics of op-amp.

b) Explain the instrumentation amplifier with three op-amps.

c) Draw the circuit diagram of wein bridge oscillator using IC741 and give expression for frequency of oscillation.

Marks

d) Draw the circuit diagram of OP-AMP based filter circuit which fulfill following response. Refer Fig. No. 2.

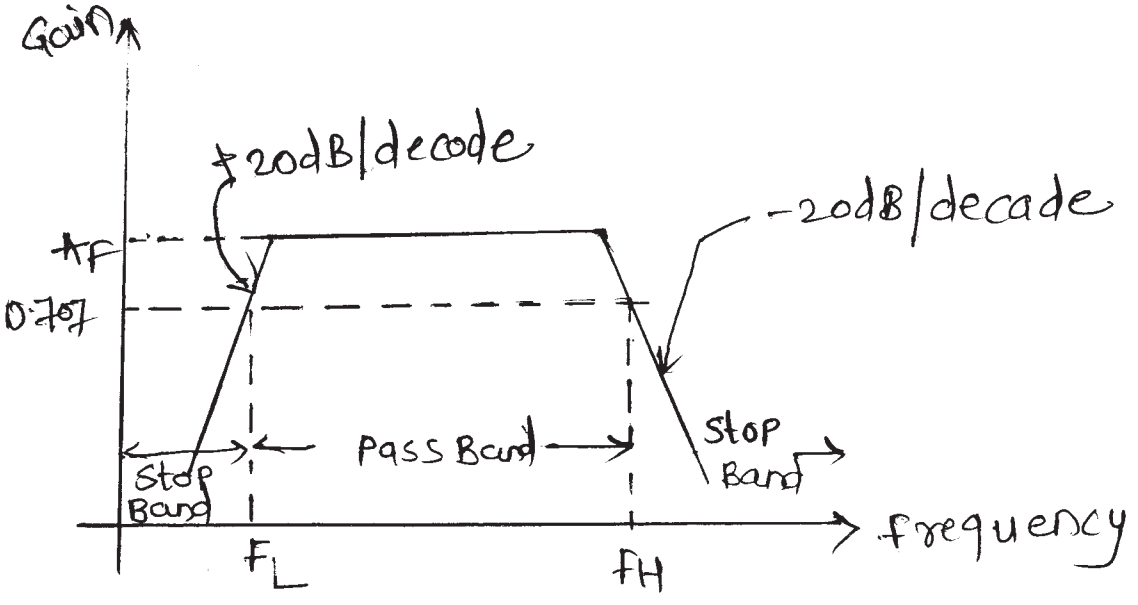

Fig. No. 2

4. Attempt any THREE of the following : **12**

a) Draw the log amplifier and antilog amplifier using op-amp.

b) Compare open loop and closed loop configuration of op-amp.

c) Construct and draw the circuit to get output voltage $V_0 = 3V1 + 2V_2$ where V1 and V2 are input voltage.

d) List advantages of active filter over passive filter.

e) Draw and describe circuit diagram of RC phase shift oscillator.

5. Attempt any TWO of the following : **12**

a) Draw and explain ideal differential amplifier. State its four configuration.

b) Compare monostable, bistable and astable multivibrator.

c) Suggest op-amp based circuit to convert square wave to triangular wave and draw the input-output waveforms.

Marks

6. Attempt any TWO of the following : **12**

a) Identify the circuit diagram. Draw its input-output waveforms and also give its output voltage equation. Refer Fig. No. 3.

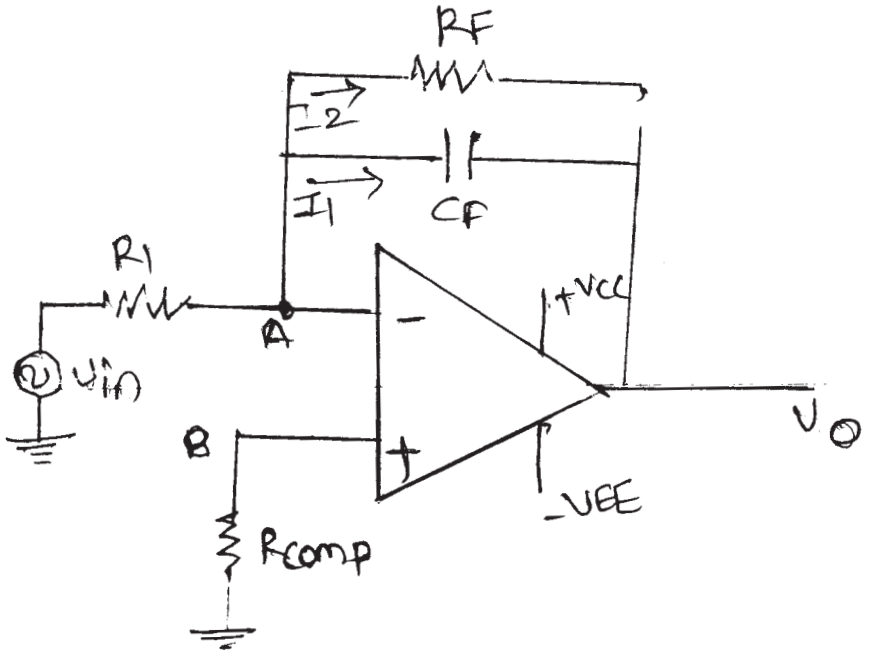

Fig. No. 3

b) Construct and draw the circuit to get output voltage $V_0 = -10\,Vin$ where vin is input voltage.

c) Explain the operation of notch filter with neat diagram and waveform.