Vivekanand College, Kolhapur (Autonomous)
Department of Electronics
Notice

Date: 21.11.2022

All the students of B.Sc. III Electronics are hereby informed that their internal examination for Semester V will be conducted in offline mode as per attached schedule.

Paper	Section	Section title	Marks	Date	Time
DSE 1005E1	I	Linear Integrated Circuits	10	28-11-2022	02:00pm-02.30pm
DSE 1005E1	II	8051 Microcontroller Interfacing and Embedded C	10	29-11-2022	02:00pm-02.30pm
DSE 1005E2	I	Instrumentation	10	30-11-2022	02:00pm-02.30pm
DSE 1005E2	II	Antenna and Wave Propagation	10	01-11-2022	02:00pm-02.30pm

VIVEKANAND COLLEGE ESTD. JUNE 1964 KOLHAPUR-416 003

(Dr. C. B. Patil)
Head
Department of Electronics
Vivekanand College, Kolhapur.

B.Sc. Part- III (Electronics) (Sem-V) Internal Examination: November-2022

Course Code: DSE 1005E1

Section - I: Linear Integrated Circuits **Marks: 10**

Q.1.Select the correct alternative **(2 M)**

1. The output of a Schmitt trigger is a……..

   a) pulse waveform. b) triangular waveform

   c) saw tooth waveform d) Sine waveform

2. Virtual ground of an op-amp means……

   a) Input is grounded directly

   b) Input is not physically grounded but terminal voltage is zero due to the other terminal is connected to the ground due to op-amp properties.

   c) Both (a) and (b)

   d) None of the above

Q.2. Solve any Two **(4*2=8M)**

1. Draw the circuit diagram of an Op-Amp adder that can add three input signals. Derive an expression for output voltage.
2. Explain with circuit diagram V to I converter using Op-Amp.
3. Draw the circuit diagram of an Op-Amp as Subtractor that can add three input signals. Derive an expression for output voltage.
4. Explain Op-Amp as non-inverting amplifier with circuit diagram. Derive the expression for output voltage

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Shri Swami Vivekanand ShikshanSanstha's

Vivekanand College, Kolhapur (Autonomous)

Class: B.Sc.-III, Semester-V,Internal Examination (2022-23)

Paper code: DSE-1005E1

Section II: 8051 Microcontroller Interfacing and Embedded C

Date:-29/11/2022

Time: 02:00pm to 02:30pm Marks: 10

Q. 1 Select correct alternative for the following: **[2 x 1 = 2]**

i. Data range for signed char data type is ----------
A) 0 to 255 B) -128 to +127 C) 0 to 65535 D) -32768 to +32767

i. The output of Thumbwheel switch is in …… ..form.
A) Octal B) BCD C) Hex D) ASCII

Q.Solve any TWO: **[2 x 4 = 8]**

i. Mention the advantages of embedded-C over Assembly language. Tabulate various Data types in 8051-C

ii. Write an 8051-C to generate a square wave on port P1 using timer delay.

iii. Interface single seven segment display with 8051 and write 8051-C program to display the digits 0 to 9 continuously.

iv. Draw an interfacing diagram of LED with 8051 and write 8051-C program to blink Led with certain time interval.

VIVEKANAND COLLEGE KOLHAPUR

B.Sc. III

Internal Examination 2022

Instrumentation

Marks: 10

Q.1) Select Correct alternatives (02)

1) _____ transducers require external power source for their operation.

a) Passive b) Active c) Both a & b d) None of these

2) Which of the following transducer is used for displacement measurement?

a) Thermocouple b) LDR c) LVDT d) RTD

Q.2) Attempt any two (08)

1) Write a note on thermistor.

2) Explain construction and working of LVDT

3) Explain with block diagram single channel DAS.

4) Explain concept of amplification and attenuation in signal conditioning.

5) Write a note on LDR.

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

B.Sc. Part- III (Electronics) (Sem-V)

Internal Examination 2022

Course Code: DSE - 1005 E2

Section - II: Antenna and Wave Propagation

Q.1) Select most correct alternatives for the following (one mark each) **[2 Marks]**

i. ---------- propagation involves a radio signal that travels along the surface of the earth.

A) Space wave B) Sky wave

C) Ground wave D) None of these.

ii. The widely used shape for patch antennas is ----------

A) Rectangular B) Circular

C) Elliptical D) Parabolic

Q.2) Attempt any Two (Four marks each) **[8 Marks]**

1. Explain the structure of microstrip patch antenna. Discuss it's feed mechanism.
2. Explain the working principle and radiation pattern of monopole antenna.
3. Write the frequency range, wave propagation principle and two application of space wave propagation.
4. Define the following terms
   a. Critical frequency
   b. Maximum usable frequency
   c. Skip distance
   d. Virtual height.

Sakshi Tushar Bhopale. 09/10

॥ ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार ॥
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VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor

Suppliment No. :
Roll No. : 8358
Class : BSc-TY sem V

Subject : Electronics (LIC)
Test / Tutorial No. : Internal Exam
Div. :

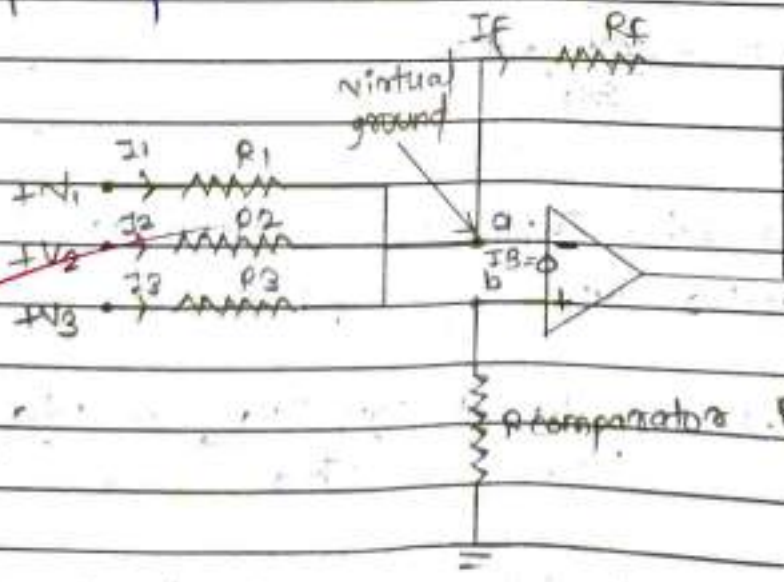
Q. 1)

1) d) sine waveform

2) b) Input is not physically grounded but terminal voltage is zero due to other terminal is connected to the ground due to op-amp properties.

Q. 2)

1) Op-amp as Adder



For ideal op-amp,

open loop gain is given as,

$$A_{OL} = \frac{V_o}{V_d} = \infty \quad \frac{V_o}{V_a - V_b} = 0$$

Since, V_d is differential input voltage is finite.

thus $V_a = V_b = 0 \quad \therefore \quad V_2 - V_1 = 0$

Since input impedance of op-amp $R_i = \infty$ that implies no current flows into or out of op-amp inverting terminal.

$$\therefore \quad I_B = 0 \quad \text{---} (1)$$

According to KCL at node 'a'

$$I_* = I_B + I_F \quad \text{---} (2)$$

[illegible]

$$\therefore \quad [\text{illegible}] = -\frac{[\text{illegible}]}{[\text{illegible}]} \cdot [\text{illegible}]$$

$$\therefore \quad I_1 + I_2 + I_3 = I_f \quad \text{---} \text{ from } (1)$$

By ohm's law

$$\therefore \quad \frac{V_1 - V_a}{R_1} + \frac{V_2 - V_a}{R_2} + \frac{V_3 - V_a}{R_3} = \frac{V_a - V_{out}}{R_f}$$

$$\therefore \quad \frac{V_1}{R_1} + \frac{V_2}{R_2} + \frac{V_3}{R_3} = -\frac{V_{out}}{R_f} \quad \text{---} \quad V_a = 0$$

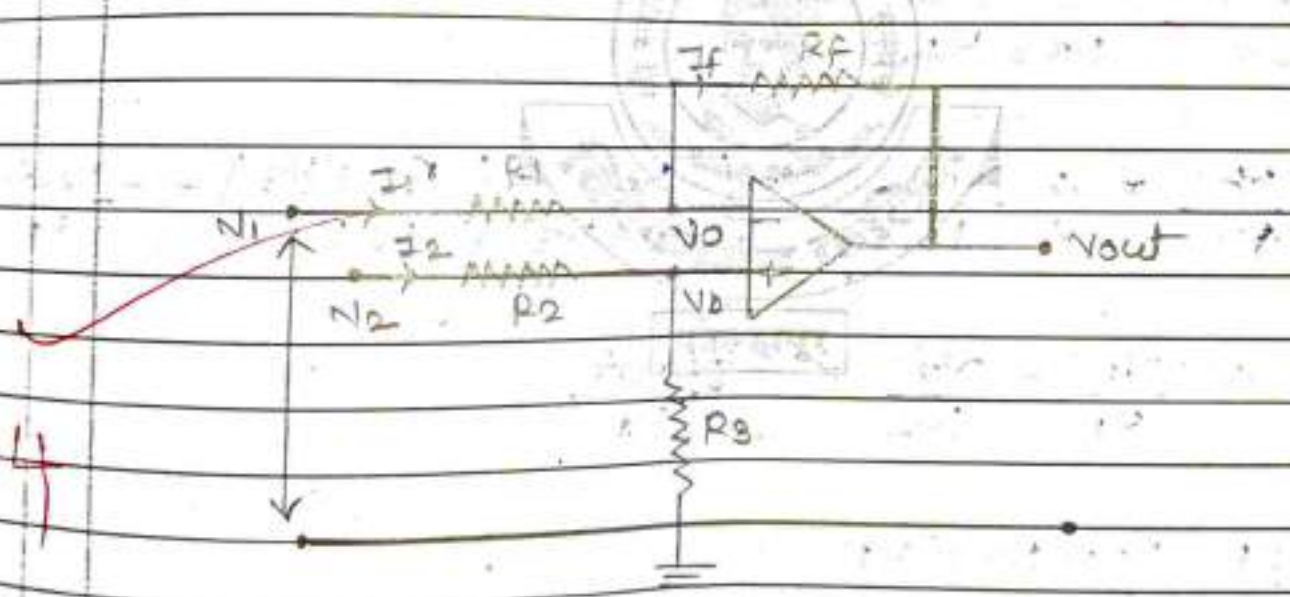
If $R_1 = R_2 = R_3 = R_f$

$\therefore \quad V_1 + V_2 + V_3 = -V_{out}$

$\therefore \quad \boxed{V_{out} = -(V_1 + V_2 + V_3)}$

that is output voltage is the negative sum of all input voltages.

g) op-amp as Subtractor



According to Kirchoff's Current law ~~at~~ V_a

$$I_{in} = I_f$$

$$\frac{V_1 - V_a}{R_1} = \frac{V_a - V_{out}}{R_f}$$

$$\frac{V_1}{R_1} - \frac{V_a}{R_1} = \frac{V_a}{R_f} - \frac{V_{out}}{R_f}$$

$$\therefore \frac{V_1}{R_1} - \frac{V_a}{R_1} - \frac{V_a}{R_f} = -\frac{V_{out}}{R_f}$$

$$\therefore \frac{V_1}{R_1} - V_a\left(\frac{1}{R_1} + \frac{1}{R_f}\right) = -\frac{V_{out}}{R_f}$$

Now, by potential divider formula

$$\therefore V_a = V_b = V_2\left(\frac{R_3}{R_2+R_3}\right)$$

$$\therefore \frac{V_1}{R_1} - V_2\left(\frac{R_3}{R_2+R_3}\right)\left(\frac{R_1+R_f}{R_1 R_f}\right) = -\frac{V_{out}}{R_f}$$

If $R_1 = R_2$ and
$R_3 = R_f$

$$\therefore \frac{V_1}{R_1} - V_2\left(\frac{R_3}{R_2+R_3}\right)\left(\frac{R_2+R_3}{R_2 R_3}\right) = -\frac{V_{out}}{R_f}$$

$$\therefore \frac{V_1}{R_1} - \frac{V_2}{R_2} = -\frac{V_{out}}{R_f}$$

If $R_1 = R_2 = R_f$

$$\therefore V_1 - V_2 = -V_{out}$$

$$\boxed{V_{out} = V_2 - V_1}$$

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Signature of Supervisor

Suppliment No. :

Roll No. : 8359

Class : BSc.-III

Subject : Electronics [L1C]

Test / Tutorial No. : Electronics

Div. :

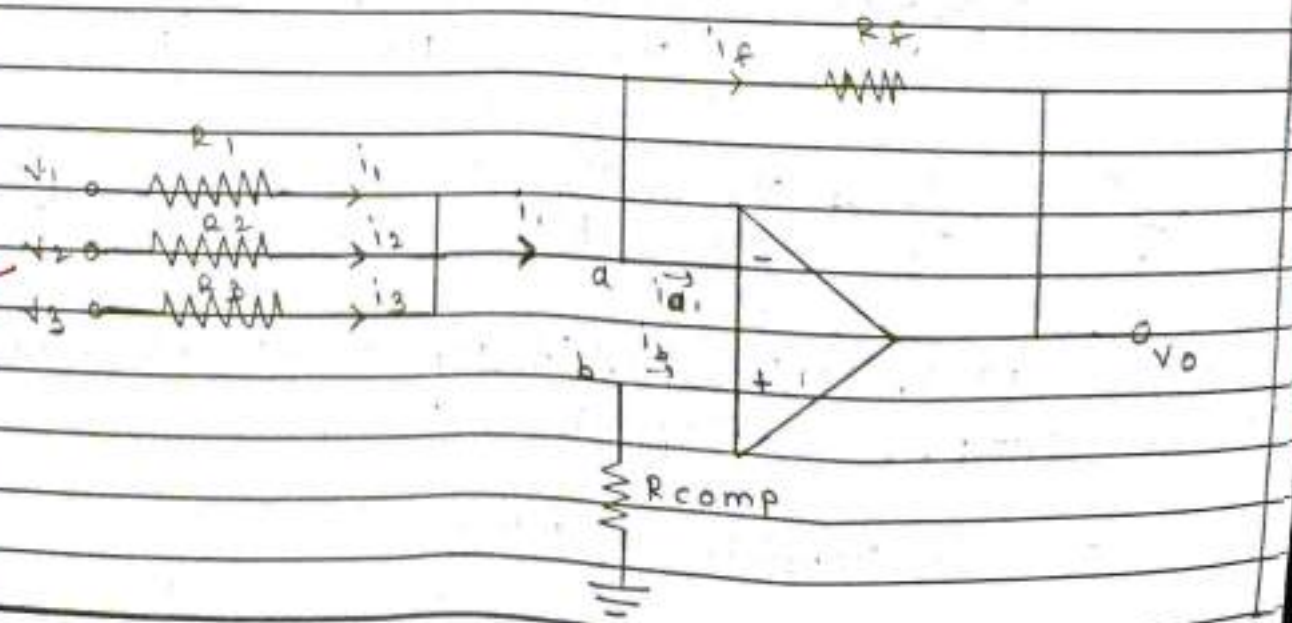
Q.1.

1) The output of schmitt trigger is a ~~pulse sine waveform~~ triangular waveform. 0 ✗

2) Virtual ground of an op-amp means Input is not physically grounded but terminal voltage is zero due to other terminal is connected to the ground due to op-amp properties. 0½

Q.2

1) Op-amp adder that can add three inputs -



The circuit used as summing amplifier. Assuming stable non-inverting linear operation, for ideal op-amp open loop gain.

$$A_{OL} = \frac{V_o}{V_d} = \frac{V_o}{V_b - V_a} = \infty$$

$\therefore V_d = V_b - V_a = 0$

input impedance R_i of the op-amp is ideally infinite, then op-amp inverting terminals

i.e. $I_B = 0$

The Kirchhoff's current law equation at node 'a' can be,

$$i = I_B + I_f$$

$$\therefore i_1 + i_2 + i_3 = i_f$$

$$\therefore \frac{V_1 - V_a}{R_1} + \frac{V_2 - V_a}{R_2} + \frac{V_3 - V_a}{R_3} = -\frac{V_o}{R_f}$$

$$\therefore \frac{V_1}{R_1} + \frac{V_2}{R_2} + \frac{V_3}{R_3} = -\frac{V_o}{R_f} \quad \text{---} \quad [\because V_a = 0]$$

If in this circuit $R_1 = R_2 = R_3 = R_f =$ the output voltage become,

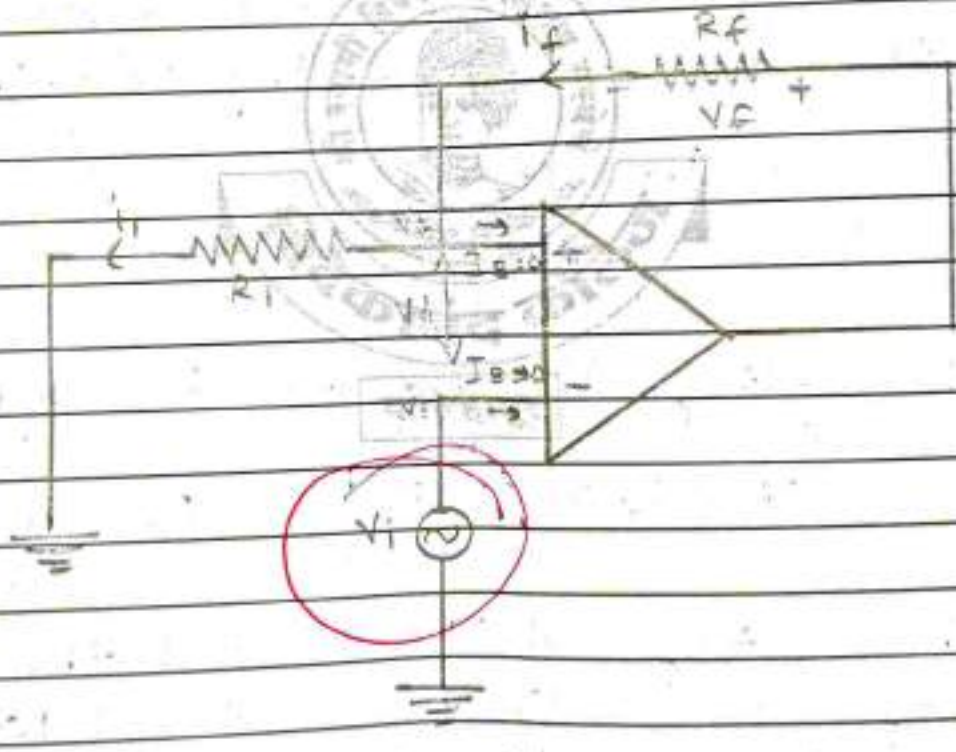
$$V_{os} = -(V_1 + V_2 + V_3)$$

$$V_o = -(V_1 + V_2 + V_3)$$

i.e. The output voltage is equal to the negative sum of all input voltages at the inverting terminal.

& The non-inverting the ~~sum of~~ positive sum of all input voltages is equal to the output voltage.

4) Op-amp as non-inverting amplifier-



The input voltage V_1 is the applied to the directly to the nonr inverting terminal. Apply stable linear operation for an ideal Op-amp open loop gain.

$$A_{OL} = \frac{V_o}{V_d} = \frac{V_o}{V_1 - V_2} = \infty$$

Since V_o is the finite, differential input voltage,

$V_d = V_1 - V_2$ is forced to be zero, & thus,

$$V_i = V_1 = V_2$$

This voltage appears across the resistor R_f. so the current ~~so the ideally~~ i_f is readily determined as the,

$$i_f = \frac{V_f}{R_f}$$

Since no current flows into or not out of the op-amp inverting terminal,

$$\text{i.e. } I_B = 0$$

$$\therefore i_1 = i_f$$

The voltage V_f appears R_f and is

$$V_1 = i_f R_f = R_1 i_f = R_f \frac{V_1}{R_1}$$

The voltage V_i, V_d, V_f and the output voltage V_o constitute a closed loop.

Applying KVL to ~~across~~ the closed loop, we have,

$$V_o = V_i + V_d + V_f$$

$\therefore A_{OL} = \frac{V_o}{V_d} \approx \infty \quad \therefore V_d = 0$

$$\therefore V_o = V_i + V_f$$

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Roll No. : 8359
Class :

Subject : Electronics
Test / Tutorial No. : Electronics
Div. :

$$\therefore V_o = V_i + \frac{R_1}{R_f} V_i$$

$$V_o = \left[1 + \frac{R_1}{R_f}\right] V_i$$

The closed loop voltage gain A_{CL} is given

$$A_{CL} = \frac{V_o}{V_i} = 1 + \frac{R_f}{R_f}$$

$$A_{CL} = 1 + \frac{R_1}{R_f}$$

Siddhesh Vishnu Jadhav 08/10

08225

SUPPLIMENT

Signature of Supervisor

Suppliment No. :

Roll No. : 8360

Class : BSC-III

Subject : Electronic CLTC

Test / Tutorial No. :

Div. :

Q 11

→ 1) The ~~output of a~~

→ 1) pulse ~~waveform~~ sine waveform.

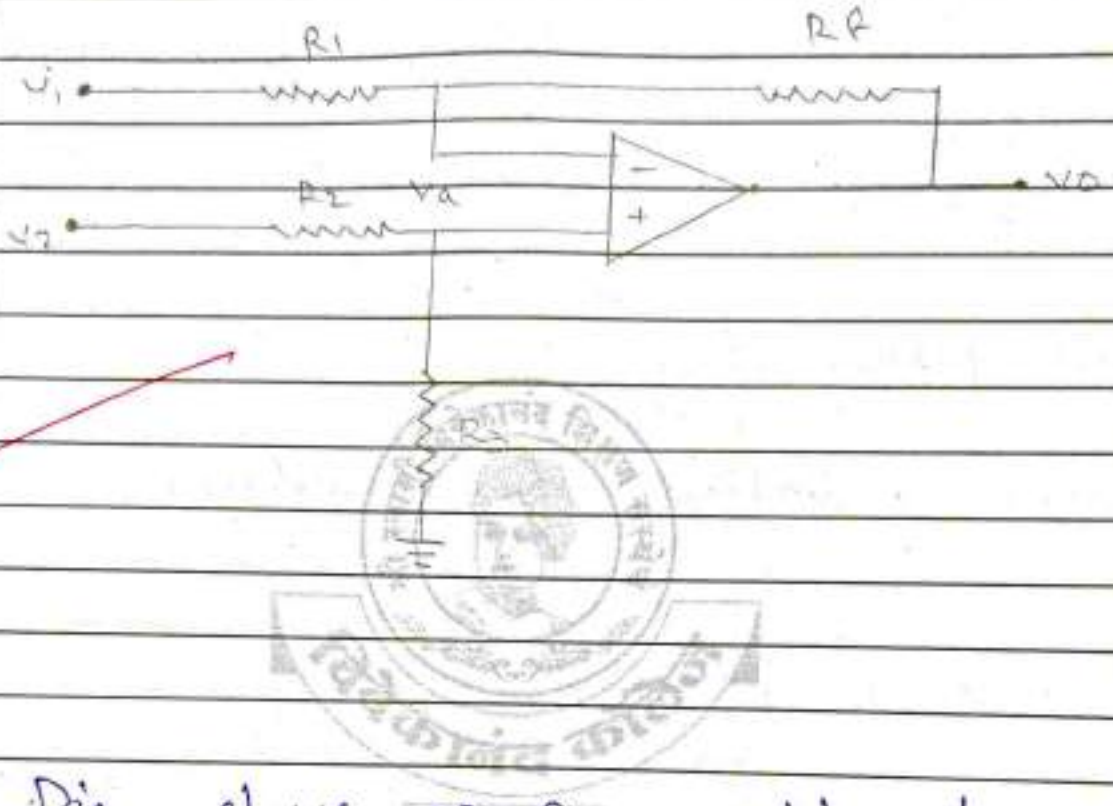
0 X

→ 2) Input is grounded directly.

0 X

Q 2

→ 3) Block dig of op-Amp subtractor.



Dig shows op-Amp subtractor.

V1 is grounded.

$\therefore V_2 = 0$

then the circuit is inverting op-Amp

then the output of the inveting op-Amp is

$$V_{o2} = -\frac{R_f}{R_i} \cdot V_1 \quad \text{---- (i)}$$

Vi is grounded.

$V_1 = 0$

then the circuit is noninveting op-Amp

$$\therefore V_{o1} = \left[1 + \frac{R_f}{R_1}\right]\left[\frac{R_3}{R_2+R_3}\right] V_2 \quad \text{---(iii)}$$

from eq (ii) and (iii)

Using the superposition principle

$$V_0 = V_{o1} + V_{o2}$$

$$= \left[\frac{-R_f}{R_1}\right] + V_1\left[1 + \frac{R_f}{R_1}\right]\left[\frac{R_3}{R_2+R_3}\right] V_2$$

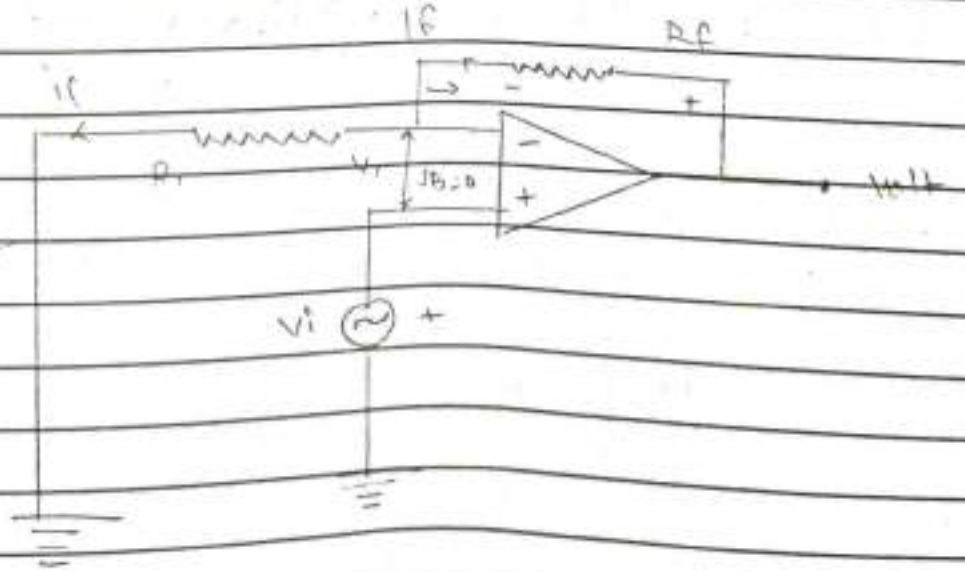
04

In circuit $R_1 = R_2 = R_3 = R$

$\therefore$ The output voltage is

$$V_0 = V_2 - V_1$$

4



04

$$A_{OL} = \frac{V_o}{V_d} = \frac{V_o}{V_1 - V_2} = \infty$$

V_o is finite Input Voltage

$V_d = V_1 - V_2$ is forced (to be zero and thus)

$$V_i = V_1 - V_2 \quad \text{---(i)}$$

This Voltage appears across the resistor R_1 so the current it

$$i_1 = \frac{V_i}{R_1}$$

OP-amp Inverting terminal $I_B = 0$

$\therefore i_1 = i_f$

The voltage V_f appear across R_f and is

$$V_f = R_f \cdot i_f = R_f i_1 = R_f \times \frac{V_i}{R_1}$$

The Voltage V_i, V_p, V_f and the output Voltage V_o Constitute a close loop.

$$V_o = V_i + V_d + V_f$$

$$V_o = V_i + V_f \left[A_{OL} = \frac{V_o}{V_d} = \infty \quad \because V_d = 0 \right]$$

$$V_o = V_i + \left[1 + \frac{R_f}{R_i} \right]$$

$$A_{OL} = \frac{V_o}{V_i} \left[1 + \frac{R_f}{R_i} \right]$$

Name :- Ankita Baldeo Khot 08/10

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SUPPLIMENT

Signature of Supervisor	

Suppliment No. :

Roll No. : 8362

Class : BSC-III

Subject : Electronic

Test / Tutorial No. :

Div. :

Q1)

i) b) traingular wave

X

2) ~~b)~~ a) ~~input is grounded directly~~

b)

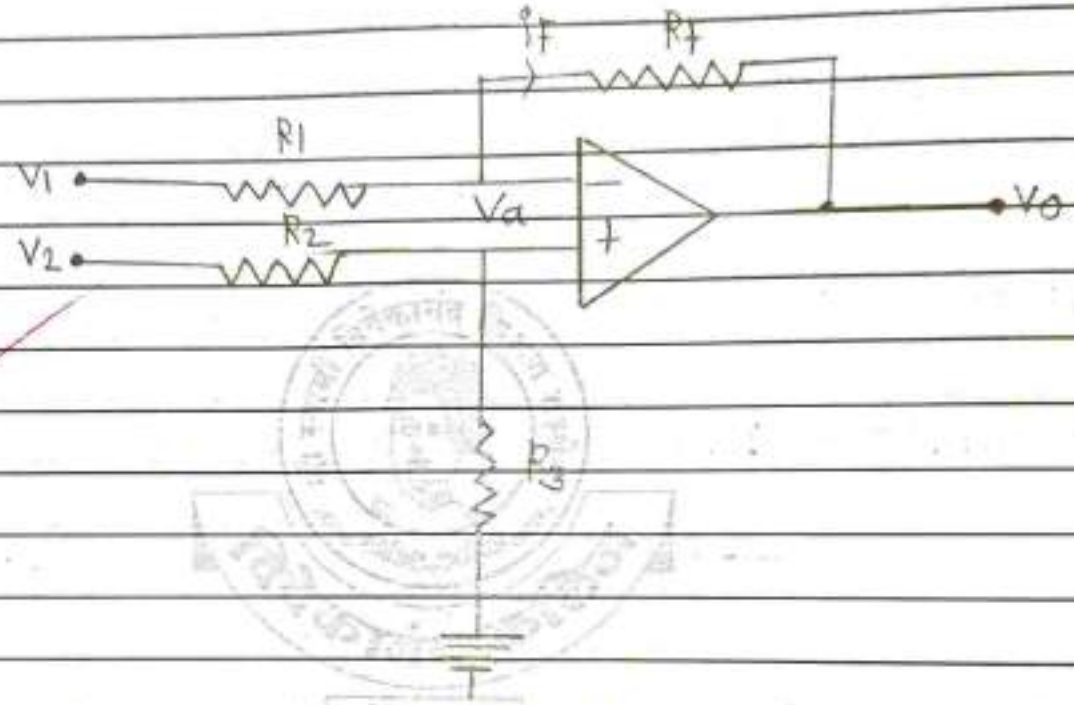
0

X

Q2)

3) Substractor

Block dig. of op-Amp substractor :-



Dig. shows op-Amp substractor:

V_2 is grounded

$\therefore V_2 = 0$

then the circuit is inverting op-Amp

then, the output of the inverting op-Amp

$$V_{o_2} = -\frac{R_F}{R_1} \cdot V_1 \quad \text{---} \quad (i)$$

V_1 is grounded

$\therefore V_1 = 0$

then the circuit is, noninverting op-Amp

$$\therefore V_{o_2} = \left[1 + \frac{R_f}{R_i}\right]\left[\frac{R_3}{R_2+R_3}\right] V_2 \quad \text{— (ii)}$$

from eq (i) and (ii)

using the, superposition principle.

$$V_o = V_{o1} + V_{o2}$$

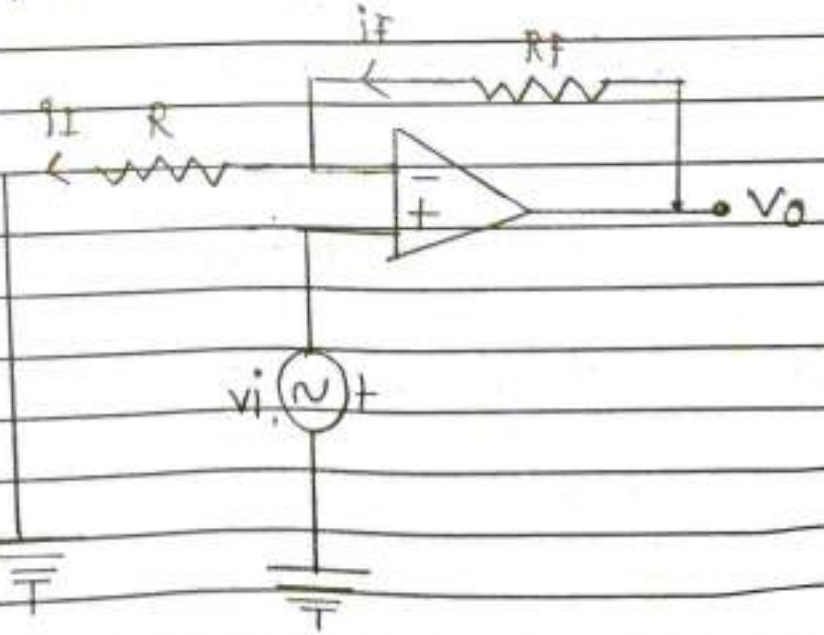
$$= \left[-\frac{R_f}{R_1}\right] V_1 + \left[1 + \frac{R_f}{R_i}\right]\left[\frac{R_3}{R_2+R_3}\right] V_2$$

In circuit $R_1 = R_2 = R_3 = R$

$\therefore$ The output voltage is

$$\boxed{V_o = V_2 - V_1}$$

4) Non-inverting amplifier :-



In non-inverting Amplifier,

fat, The most widely used op-Amp configuration is non-inverting

for an ideal -op-Amp

$$A_{OL} = \frac{V_o}{V_d} = \frac{V_o}{V_1 - V_2} = \infty$$

V_o is the finite input voltage,

$\therefore V_o = V_1 - V_2$

since,

the infinite ~~offset~~ inpet resistor R_i

$\therefore V_1 = V_2$

$V_i = V_1 = V_2$ ——— (i)

The voltage appear resistor R_i and current i_1 is given by.

$i_1 = i_f$

as for, an ideal op-Amp Inverting.

$\therefore I_B = 0$

$$i_1 = \frac{V_i}{R_i}$$

The voltage V_f appear across R_f and is

$V_f = R_f \cdot i_f = R_f \cdot i_1$

$$R_F = \frac{V_i}{R_i}$$

The voltage v_i, v_d, v_f and the output voltage v_o constitute a closed loop.

Applying KCL.

$$v_o = v_i + v_d + v_f$$

$$= v_i + v_f \quad \left[\because A_{OL} = \frac{v_o}{v_d} = \infty, \; \therefore v_d = 0\right]$$

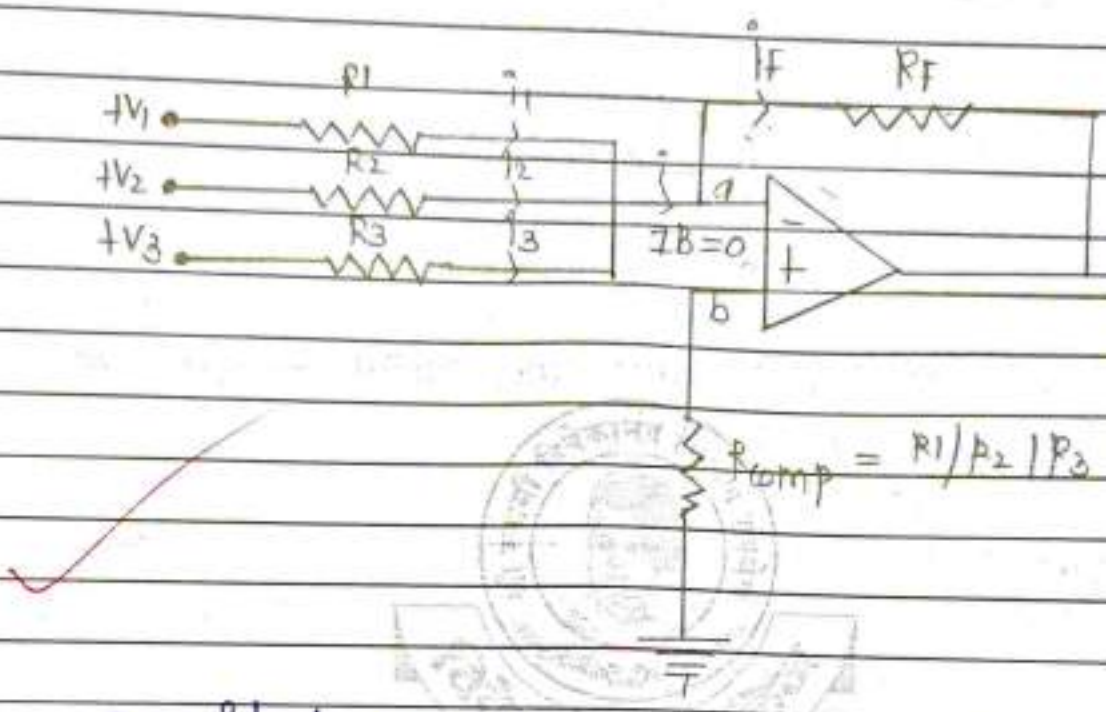
04

$$v_o = \left[1 + \frac{R_F}{R_1}\right] v_i$$

$$A_{OL} = \frac{v_o}{v_i} = \left[1 + \frac{R_F}{R_1}\right]$$

1) Adder

1) Inverting :-



for, ideal op-Amp

$$A_{OL} = \frac{V_o}{V_d} = \frac{V_o}{V_2 - V_1} = \infty$$

Vo is forced to be zero,

$\therefore V_o = V_1 - V_2$

$\therefore V_1 = V_2$

since,

infinite input impedance RF.

$I_B = 0$

Applying KCL.

$i = I_B + i_f$

$= i_1 + i_2 + i_3 = i_f$

$$\frac{V_1 - V_a}{R_1} + \frac{V_2 - V_a}{R_2} + \frac{V_3 - V_a}{R_3} = \frac{-V_o}{R_F}$$

$$= \frac{V_1}{R_1} + \frac{V_2}{R_2} + \frac{V_3}{R_3} \quad [\because V_a = 0] = \frac{-V_o}{R_F}$$

In ~~circuit~~ ~~$R_1 = R_2 = R_3$~~

$\therefore$ ~~$V_o = V_1 + V_2 + V_3$~~

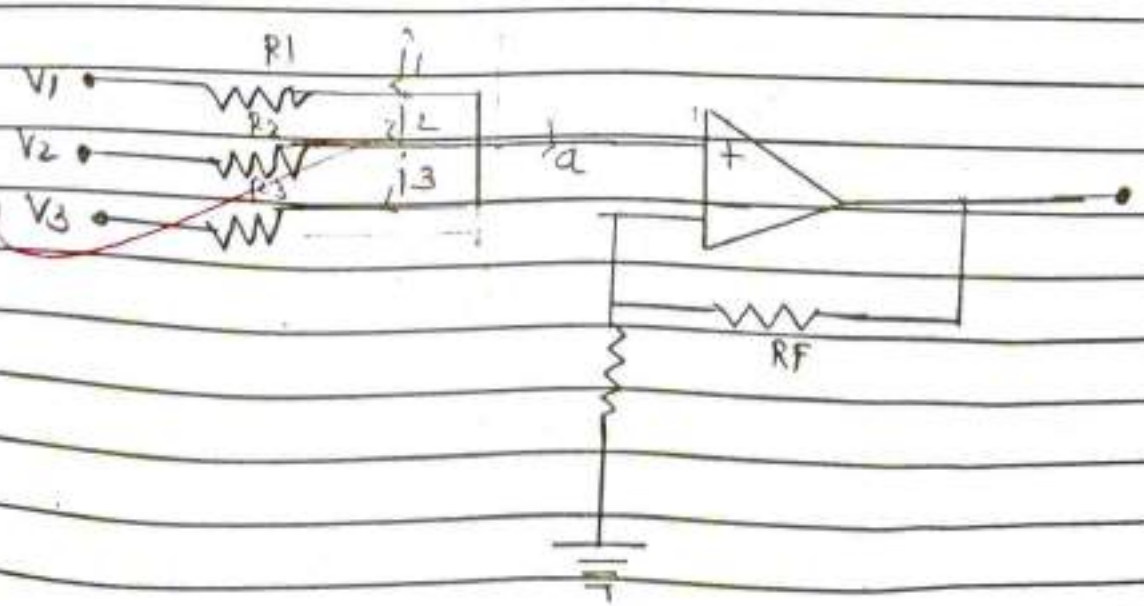
$$\therefore -V_o = -R_F \left[\frac{V_1}{R_1} + \frac{V_2}{R_2} + \frac{V_3}{R_3}\right]$$

In circuit, $R_1 = R_2 = R_3$

$$\therefore V_o = -[V_1 + V_2 + V_3]$$

$\therefore$ The output voltage is equal to negative sum of all input.

2) Non-inverting :-



equation for node a.

$$i = i_B + i_F$$

$$= i_1 + i_2 + i_3 = i_F$$

$$\frac{V_1 - V_a}{R_1} + \frac{V_2 - V_a}{R_2} + \frac{V_3 - V_a}{R_3} = \frac{-V_0}{R_F}$$

$$\frac{V_a}{R_1}\left(1 + \frac{R_F}{R_1}\right) - V_0$$

$$= \frac{V_1}{R_1} + \frac{V_2}{R_2} + \frac{V_3}{R_3} = \frac{-V_0}{R_F}$$

$$R_1 = R_2 = R_3 = R_F = 0$$

$$\boxed{V_0 = V_1 + V_2 + V_3}$$

09/15

।। ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार ।।
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08227

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Suppliment No. :

Roll No. : 8361

Class : BSc III

Subject : Electronic

Test / Tutorial No. :

Div. :

Q1.)

1) The output of a schmitt triger is a

→ d) sine waveform

0 ✗

2) Virtual ground of an op-amp means.

→

~~a) Input is grounded directly.~~

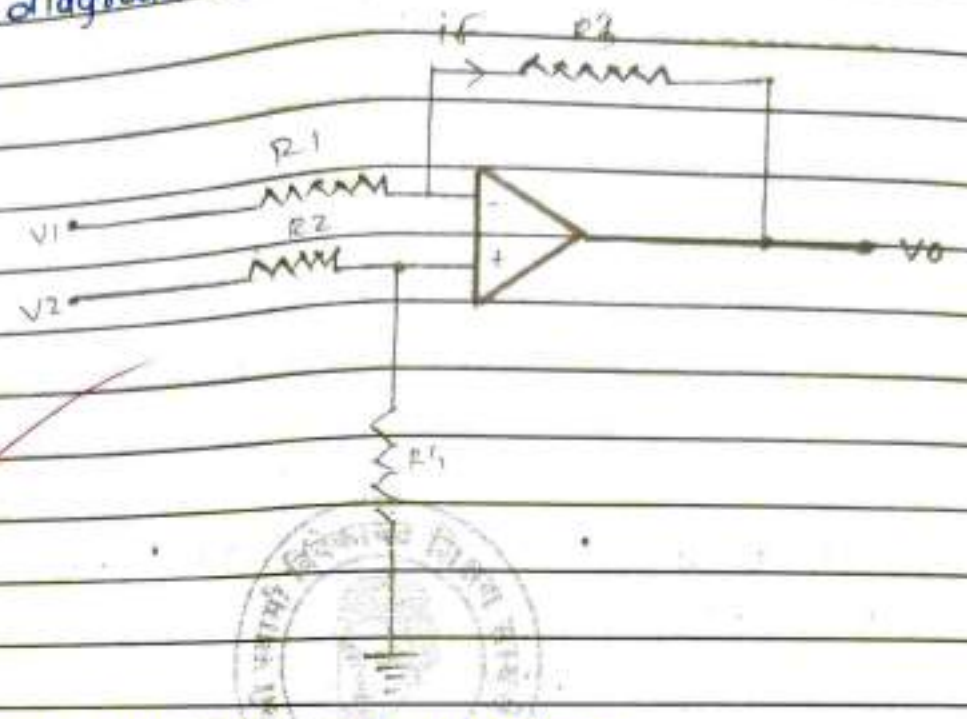
b) Input is not physically grounded but terminal voltage is zero due to the other terminal is connected to the ground due to op-amp properties.

0 / ✓

(Q 2)

3)

→ Block diagram of op-amp.



4)

Q4 Dig. Stage op-amp. substractor.

V2 is grounded then the circuit is inverting op-amp. with its output (V2=0)

$$V_{o1} = \frac{-R_f}{R_i} V_1 \quad \text{——— (i)}$$

V1 is grounded

V1 = 0

then the circuit is. noninverting op-amp.

$$V_{o2} = \left(1 + \frac{R_f}{R_1}\right) V_a = \left(1 + \frac{R_F}{R_1}\right)\left(\frac{R_3}{R_2+R_3}\right) \quad \text{——— (ii)}$$

from eq^n (i) and (ii)

using the superposition principle

$$V_O = V_1 + V_2$$

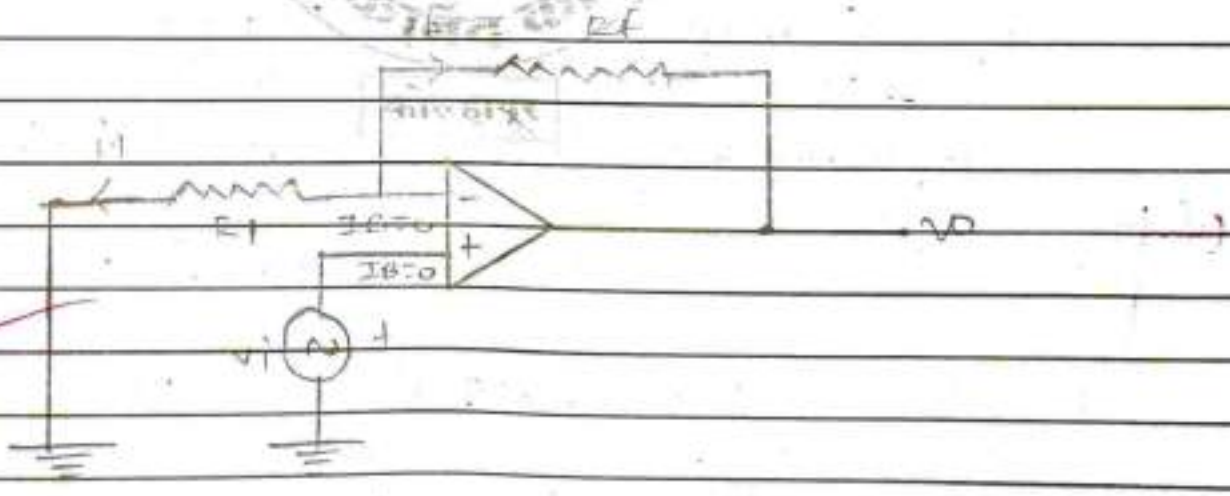
$$= \left[\frac{-R_f}{R_i}\right] V_1 + \left[\frac{1+R_f}{R_i}\right]\left[\frac{R_3}{R_2+R_3}\right] V_2$$

In circuit $R_1 = R_2 = R_3 = R$

∴ The circuit voltage is

$$\boxed{V_O = V_2 - V_1}$$

4) Non inverting amplifier-



In noninverting amplifier.

$$A_{OL} = \frac{V_O}{V_d} = \frac{V_O}{V_1 - V_2} = \infty$$

V_o is in finite input voltage
$X_d = V_1 - V_2$ is forced to be zero and thus

$$v_i = V_1 - V_2 \quad \longleftarrow \quad (1)$$

This voltage across the resistor R_1 so the current i_1

$$i_1 = \frac{v_i}{R_i}$$

op-amp inverting terminals $I_B = 0$

$$i_1 = i_f$$

The voltage v_f across R_f and is

$$V_F = R_f \cdot i_f = R_f \cdot i_1 = R_f$$

$$= R_f \frac{v_i}{R_i}$$

The voltage v_i, v_d, v_F and the output voltage v_o constitute a closed loop.

Applying KVL to this closed loop.

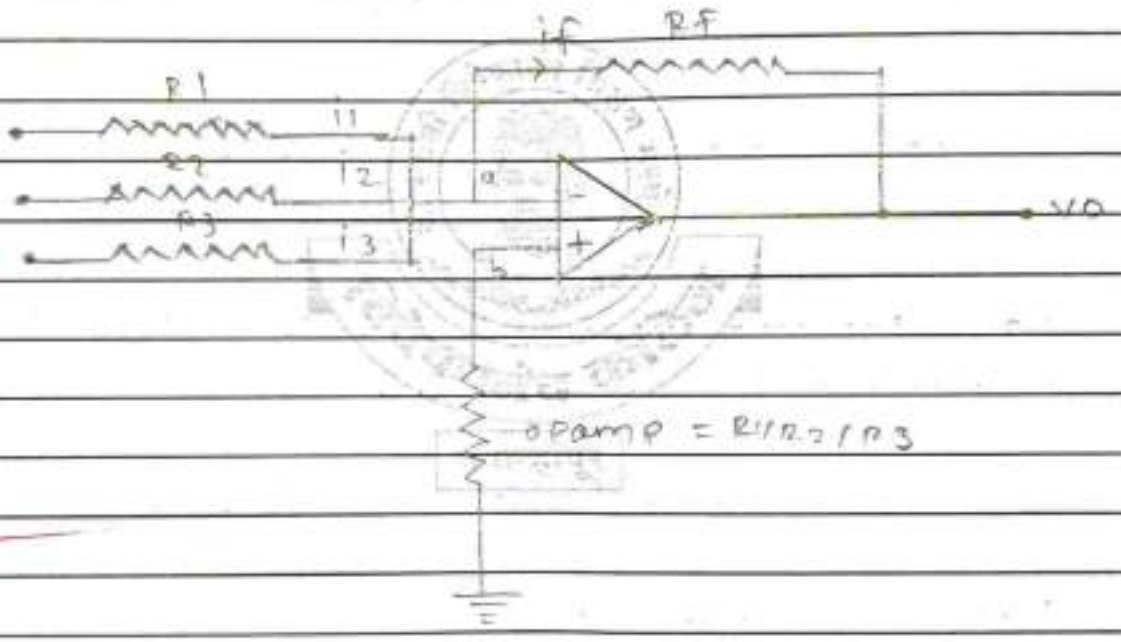
$$v_o = v_i + v_d + v_f$$

$$v_o = v_i + v_f \quad [A_{OL} = v_o/v_d = \infty \therefore v_d = 0]$$

$$v_o = v_i \left[1 + \frac{R_f}{R_i}\right]$$

$$A_{OL} = \frac{v_o}{v_1} = \left[1 + \frac{R_f}{R_i}\right]$$

1)



04

for ideal op-amp.

$$A_{OL} = \frac{V_o}{V_d} = \frac{V_o}{V_2 - V_1} = \infty$$

V_o is forced to be zero.

$$V_o = V_1 - V_2$$

$$\therefore V_1 = V_2$$

since:
infinite input impendance Rf
Applying KCL:

$$i = i_B + i_f$$
$$i_1 + i_2 + i_3 = i_f$$

$$i = \frac{v_1 - v_q}{R_1} + \frac{v_2 - v_q}{R_2} + \frac{v_3 - v_q}{R_3} = \frac{-v}{R}$$

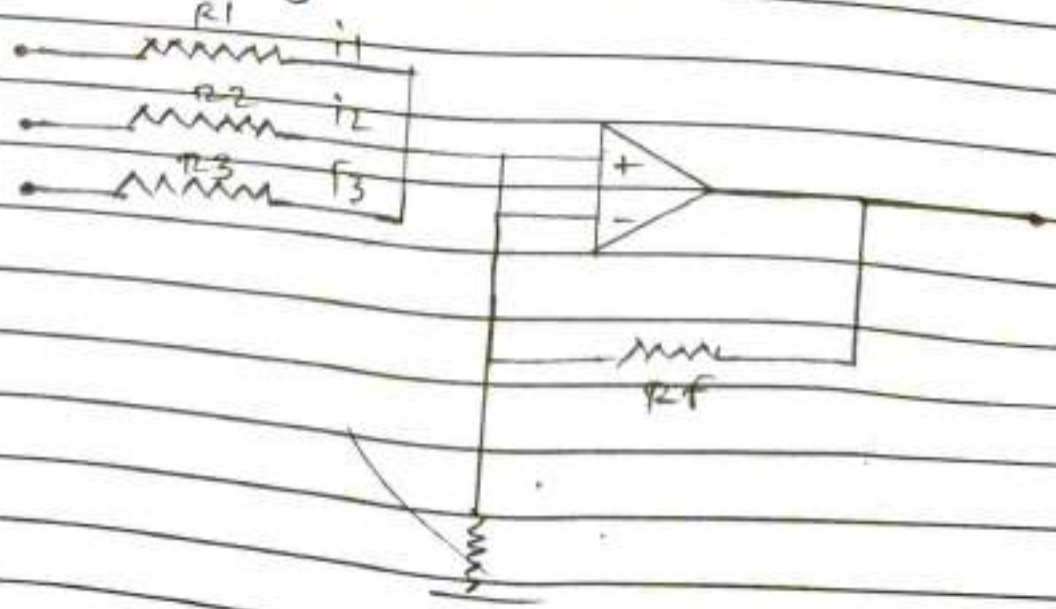
$$\frac{v_1}{R_1} + \frac{v_2}{R_2} + \frac{v_3}{R_3} = \frac{-v_o}{R_f}$$

$$v_o = -R_f \left[\frac{v_1}{R_1} + \frac{v_2}{R_2} + \frac{v_3}{R_3} \right]$$

If in the circuit $R_1 = R_2 = R_3 = R_4$ the output voltage becomes

$$\boxed{v_o = -(v_1 + v_2 + v_3)}$$

2) Non inverting.



Name - Shivani Dipak Tadakar

"ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार"

-शिक्षणमहर्षी डॉ. बापूजी साळुंखे

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	

Suppliment No. :

Roll No. : 8373

Class : BSC III

Subject : Electronics

Test / Tutorial No. :

Div. :

Q.1

i) b) ~~127~~ -128 to 127

ii) ~~c) Hex~~ b) BCD

Q.2

i)

→ Advantages

i) It is easier and less time consuming than ALP

ii) It is easy to modify and update

iii) user has facility to use function library

iv) C language generated code is transferable from one to another microcontroller.

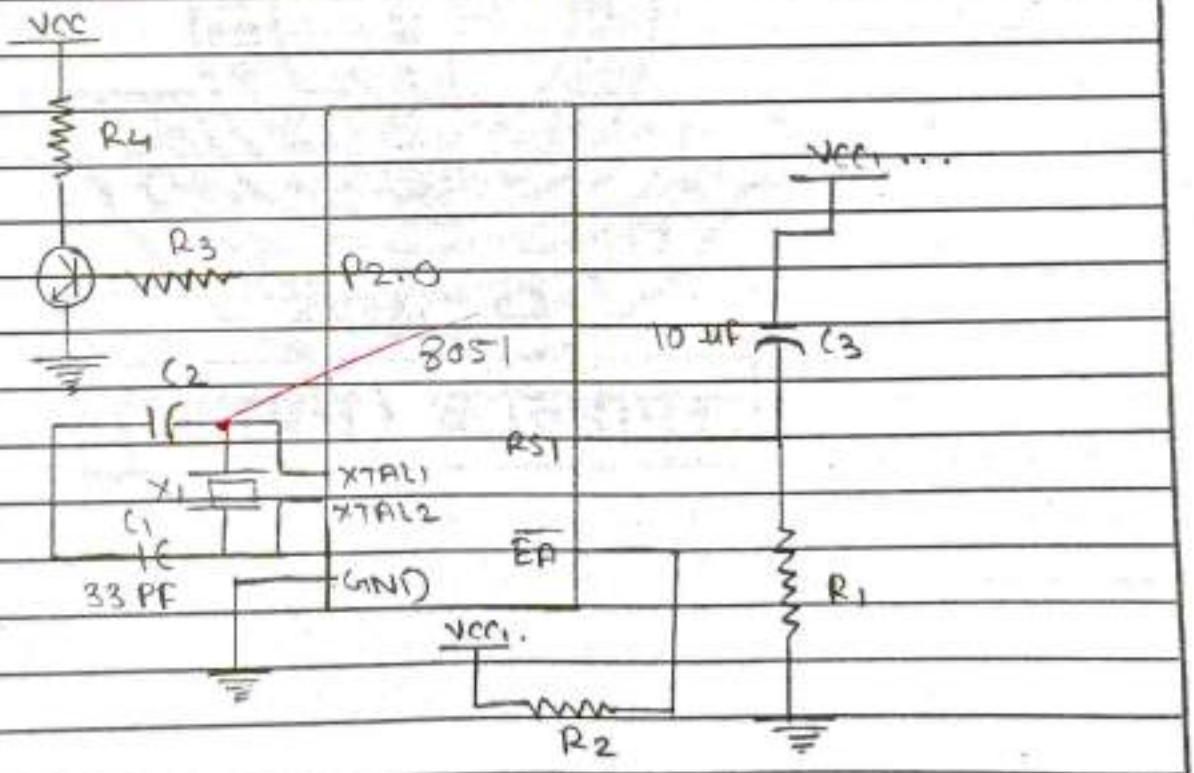
Data type	Size in bit	Data range
1) unsinged char	8- bit	0 to ~~65536~~ 255
2) (signed) char	8- bit	-128 to +127
3) ~~ss~~ unsigned int / short	16- bit	0 to 65536 ~~-32768 to +32767~~
4) (signed) int / short	16- bit	-32768 to +32767
5) Sbit	1- bit	SFR bit addresseble only
~~6)~~ ~~bit~~		
6) bit	1- bit	RAM bit addresseble area only
~~7)~~ ~~SFR~~		
7) sfr	8- bit	SFR address 80H to FFH

ii) C- Program -

```
# include <reg51.h>
mybit = P1^5
void delay (void)
void main (void)
{
   while (1)
   {

      P1 = 0x~~00~~FF;
      delay ( ) ;
      P1 = 0x00;
       delay ( ) ;
   }

}

void delay ( )
```

```
{
    TMOD = 0x01 ;
    TH0 = 0x03 ;
    TL0 = 0xff ;
    TR0 = 1 ;
    while (TF0 == 0);
    TR0 = 0 ;
    TF0 = 0;
}
```

iv) Interfacing Diagram of LED.



C-Program -

```
# include <REG X 51.H>
sbit LED = P0^0 P2^0
void delay (void)
void main (void)
{
  while (1)
  {

    LED = 1 ;
    delay ( ) ;
    LED = 0 ;
    delay ( ) ;
  }
}

void delay ( )
{

TMOD = 0x01 ;
TH0 = 0x00 ;
TL0 = 0x00 ;
TR0 = 1 ;
while ( TF0 == 0) ;
TR0 = 0 ;
TF0 = 0 ;
}
```

Akanksha santosh shinde

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-शिक्षणमहर्षी डॉ. बापूजी साळुंखे

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VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	

Suppliment No. :

Roll No. : 8371

Class : BSc III

Subject : Electronics

Test / Tutorial No. : Internal exam

Div. :

08/10

Q 1)

1) Data range for signed char data type is -128 to +127

2) The output of Thumbwheel switch is in Hex form

(Q 2)

1) advantages of embedded c — consuming
i) it is easier and less time ~~conjurming~~ then ALP.
ii) easy to modify and update.
iii) the user has facility to use a function library.
iv) The embeded c language generates code is transferable and for one or other microcontroller.

data types in c —

The c language provided all the data type of standard c data types. it also provides some additional data types which are related to 8051 micro-controller. Data types c programing languages helps us to declaring variable in programs.

The following table shows most widely used data types.

Sr No.	Data types	size in bits	Data range
1	unsigned char.	8-bit	0 to 255
2	(signed) char.	8-bit	-128 to +127
3	unsigned int/char	16-bit	0 to 65535
4	(signed) int/char	16-bit	-32768 to +32767
5	~~SFR~~ S bit	1-bit	SFR bit addressable only
6	bit	1-bit	RAM bit addresble area only
7	sfr	8-bit	SFR address 80H to FFH. i'e. RAM location whose address from

2) write an 8051 - C generate square wave on port p1 using time delay.

```
# include < REGX51.H>
mybit = P1^5 ;
void delay (void)
void main (main)
{
while(1)
{
P1 = 0xff ;
delay ( ) ;
P1 = 0x00 ;
delay ( ) ;
}
}
void delay ( )
{
TMOD = 0x01 ;
TH0 = 0x03 ;
TL0 = 0xff ;
TR0 = 1 ;
while (TF0 = 0) ;
```

Prerana Pradeep Shirke

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SUPPLIMENT

Signature of Supervisor	

Suppliment No.:

Roll No. : 8372

Class : BSc. TY

Subject : 8051 microcontroller and embedded-C.

Test / Tutorial No. : Internal Exam

Div.:

Q.1

1) Data range for signed char data type is -128 to +127

2) The output of Thumbwheel switch is in Hex form.

Q.2

1)

→ Advantages of embedded-C over assembly language:

1) Assembly language is tedious and time consuming but embedded-C language is less time consuming than ALP.

2) ALP has no function library facility but embedded C has facility to use function library.

3) Program updating and modification is complicated in assembly language but it is easy to modify and update program in embedded-C.

4) The code generation in assembly language is not easily portable to another microcontroller but in embedded-C it is easy to transfer data from one to other microcontroller.

Tabulate of various Data type:

Sr No.	Data type	~~Data~~ size ~~range~~ of bit	Data range.
1	Unsigned char	8-bit	0 to 255
2	signed char	8-bit	-128 to +128
3	Unsigned int	16-bit	-32768 to +32767
4	S-bit	1-bit	SFR ~~function~~ bit is addressable only
5	bit	1-bit	RAM addressable bit area only
6	SFR.	8-bit	SFR: address 80H to FFH i.e whose RAM access address from 80H to FFH.

2)
→

```
# include <reqx51.h>
mybit = P1^5 ;
void delay (void);
Void main (void)
{
  while (1)
    {
      P1 = 0XFF;
      delay ();
      P1 = 0X00;
      delay ();
    {

    }
Void delay ()
    {
      TMOD = 0X01;
      TH0 = 0X DD;
      TL0 = 0XFF;
      TR0 = 1 ;
      while (TF0 == 0);
      TR0 = 0 ;
      TF0 = 0 ;
    }
```

Sakshi Tushar Bhopale.

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SUPPLIMENT

Signature of Supervisor	

Suppliment No. :

Roll No. : 8358

Class : BSc TY. sem V.

Subject : Electronics (I)

Test / Tutorial No. : Internal Exam

Div. :

08/10

Q.1)

i) Data range for signed char data type is, -128 to 127

ii) The output of thumbwheel switch is in Hex form.

i)

Advantages of embedded C over ALP

i) ALP is tedious and time consuming but embedded C languages is less ~~than~~ time consuming than ALU.

ii) ALP has no function library facility but embedded C has facility to use function library.

iii) Program updating and modification is complicated in ALP but in embedded C, modifying and update is easy.

iv) The code generation in ALP is not easily portable in another microcontroller but in embedded C it is easy to trasfer data from one to another microcontroller.

Sr No	Data type	size of bit	Data range
1.	unsigned char	8 bit	0 to 255
2.	signed char	8 bit	-128 to +128
3.	unsigned int.	16 bit	-32768 to +32767
4.	s bit	1 bit	SFR bit is addressable only
5.	bit	1 bit	RAM area addressable only
6.	SFR	8 bit	SFR address 80H to FFH i.e. whose RAM address from 80H to FFH

ii)

```
# include < REGX51.H >
void delay (void)
void main (main
```

```
# include < REGX51.H >
mybit = P1^5 ;
void.delay (void) ;
void main (void)
{
  while (1)
  {
    P1 = 0XFF;
    delay ();
    P1 = 0X00;
    delay ();
  }
}
Void delay ()
  {
    TMOD = 0X01 ;
    TH0 = 0X00 ;
    TL0 = 0XFF ;
    TR0 = 1 ;
    while ( TF0 == 0 ) ;
    TR0 = 0 ;
    TF0 = 0 ;
  }
```

Name :- Ankita Balaso Khot

" ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार "

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SUPPLIMENT

Signature of Supervisor	

Suppliment No. :

Roll No. : 8362

Class : BSc-III

10/10

Subject : Electronics

Test / Tutorial No. :

Div. :

Q1)

1) B) −128 to +127

i) ~~c)~~ ~~Hex~~ B) BCD

2)

Q2)

i) * Advantage of embedded C-over assembly language

i) It is easily and less time consuming than APL.

ii) It is easy to modify and update.

iii) User has use to function library.

iv) C-language generated code for one to other microcontrollers.

* Tabulate various Data type in 8051-C

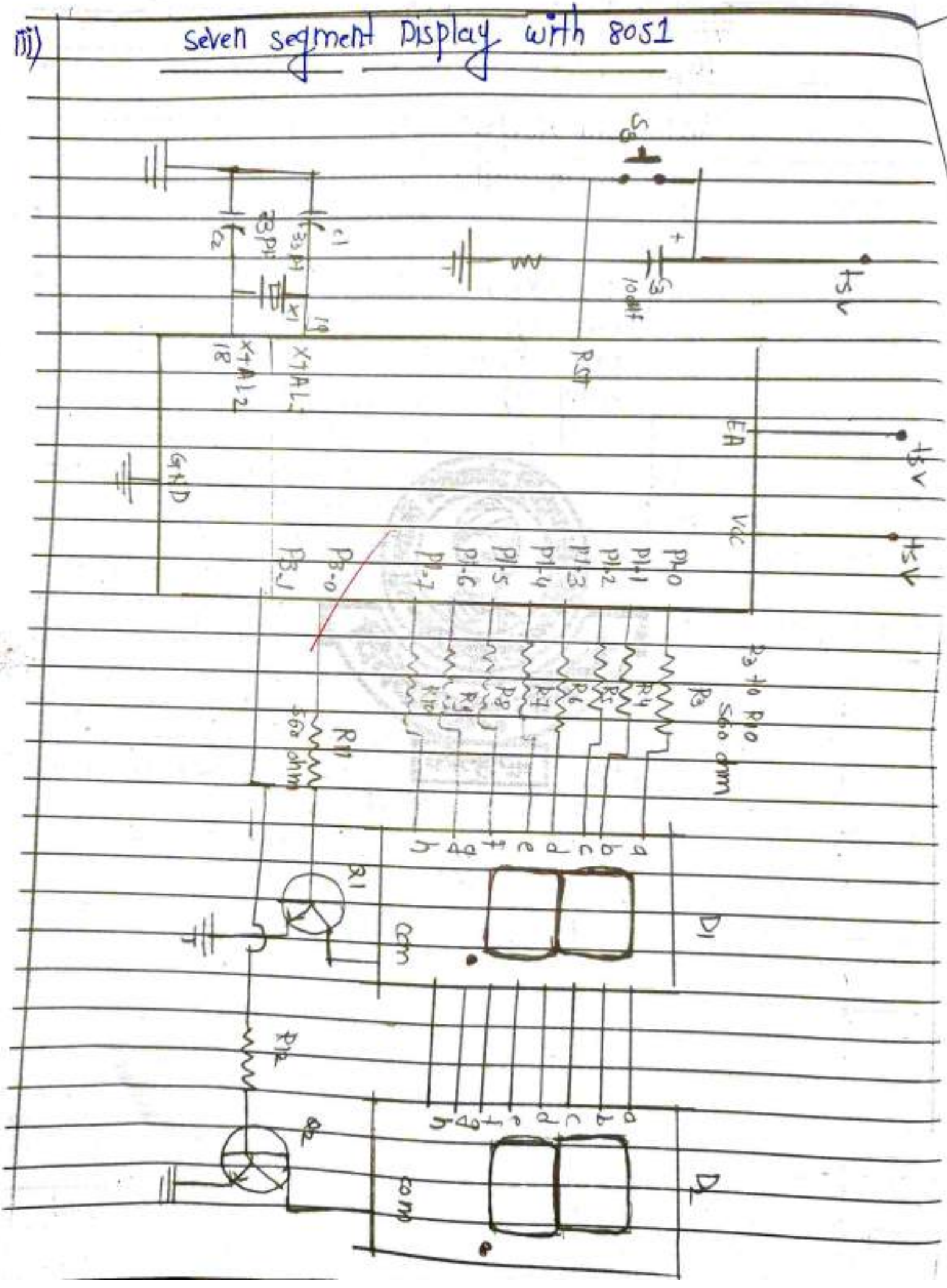
Sl.No	Data type	size in bit	Data range
1.	unsigned char	8-bit	0 to 255
2.	(Singed) char	8-bit	-128 to +127
3.	unsigned int/ short	16-bit	0 to 65536
4.	(signed) int/ short	16-bit	-32768 to +32767
5.	sbit	1-bit	SFR address only
6.	Bit	1-bit	RAM address area only.
7.	Sfr	8-bit	SFR address 80H to FFH.

ii)

```
#include <reg x51.h>
my bit p12s;

Void dely (void);
void main (main)
{
  { P1 = 0xff;
    delay ();
    P1 = 0x00;
    delay ();
  }
}
Void delay ()
{
  { TMOD = 0x01;
    TH0 = 0x03;
    TL0 = 0xff;
    TR0 = 1;
    while (TF0 == 0);
    TR0 = 0;
    TF0 = 0;
  }
```

iii) Seven segment Display with 8051



Name :- Ankita Balaso Khot

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SUPPLIMENT

Signature of Supervisor	

Suppliment No. : 1
Roll No. : 8362
Class : BSC-III

Subject : Electronics
Test / Tutorial No. :
Div. :

Program :-

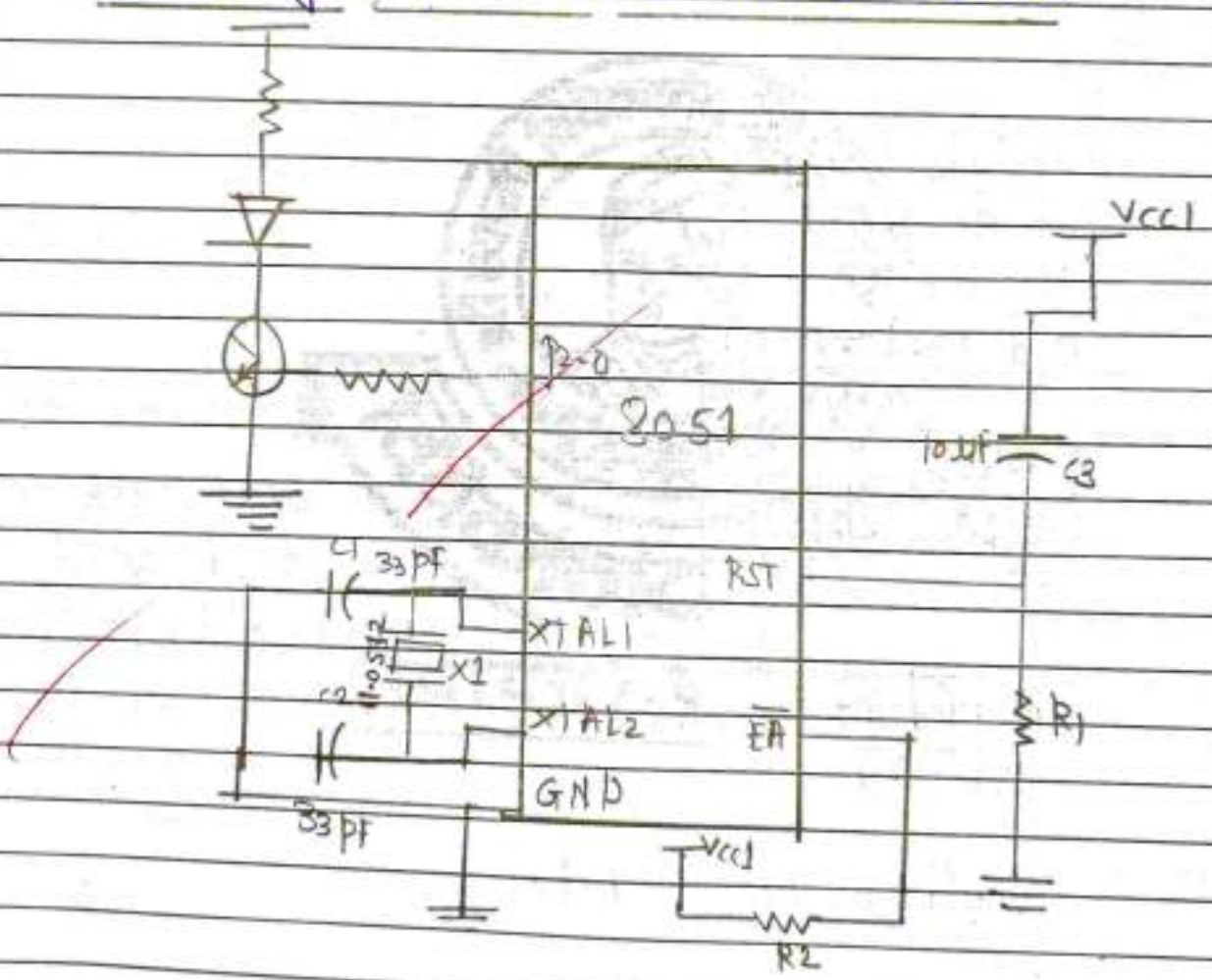
```
#include <reg51.h>
sbit a = P3^0;
sbit b = P3^1;
Void mdelay ()
      main
{
unsigned char seg_cod [] = {0xBF, 0x06, 0x5b, 0x4f
0x66 , 0x6d , 0x7d ,
0x07 , 0x7f , 0x6f};

unsigned int i, j, k;
while (1)
{
for(i=0; i<100; i++);
{
{a=1;
b=0;
P1 = seg code [i/10];
for (k=0; k<35000; k++);
a=0;
b=1;
```

(4)

```
P1 = Seq. code [i % 10];
for (k=0; k<35000; k++);
}
}
}
```

Interfacing LED with 8051 microcontroller.



```
#include <reg51.h>
sbit LED= P2^0
void Delay (void)
void main (main)
{
while(1)
{
LED=1;
delay ();
LED=0;
delay ();
}
}
void delay
{
TMOD =0x01;
TH0 =0x00;
TL0 =0x00;
TR0 = 1;
while (TF0 ==0);
TR0 =0;
TF0 =0;
}
```

Sandeep Jaysing Patil.

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VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	

Suppliment No. :

Roll No. : 8368

Class : BSc III

10/10

Subject : Electronics

Test / Tutorial No. : Internal exam (Instrumentation)

Div. :

Q.1

1) Possive transducers require external power source for their operation.

2) Which of the following transducers is used for displacement measurement ?

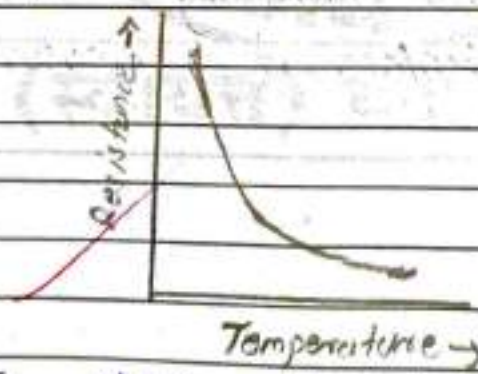
⇒ LVDT

Q.2

1) Thermistor

① Thermistor is temperature sensitive device.
② If the temperature varies then the resistance of thermistor either increases or decreases.
③ By using this principal thermistor is used as temperature sensor.
④ Semiconductor material are used in thermistor.
⑤ Because of semiconductor, the # resistance of thermistor is sightly varies with temperature more than the normal resistance.
⑥ Thermistor are classified into two types.
  (a) Negative temperature coefficient (NTC)
  (b) Positive temperature coefficient (PTC)

⑥ NTC termistor characterstics are very common as shown in figure



⑦ In NTC thermister, resistance decreases as the temperature increase as following equation

$$R_T = R_0 e^{\beta\left(\frac{1}{T} - \frac{1}{T_0}\right)}$$

features of thermistor

(1) Size is about from 0.125 to 1.5 mm.
(2) Temperature range is from -100°C to 300°C
(3) Model types - Bed type, rod type and disc type.

2) Construction and working of LVDT.

LVDT is stands for Linear variable differential tranformers. It is most widely used transducer that converts linear motion into the electrical signal.

* Construction of LVDT

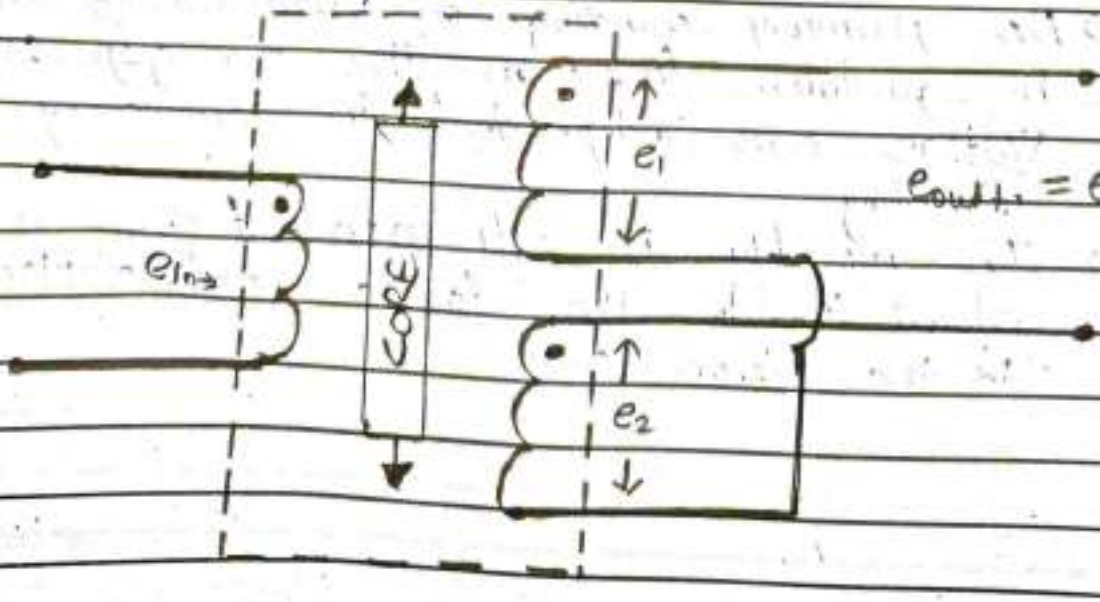
→ It consist of primary wiet winding as well as two secoundary winding. these are S_1 and S_2 which wound on a cylindrical formate.
→ Both the secoundary winding secoundry windings have equal number of turns and they are identically placed on either sides of primary winding
→ As primary winding is connected to an AC produced flux in the air gap and voltage are independent in secoundary winding
→ In movable iron soft iron core is plaied inside the former and displacement to the iron core.

Working of LVDT

Case I : In the formation at when the core is at null position both the secondary winding is equal to so the induced emf is equal to the both winding so it is shows that no displacement takes place.

Case II : When the core is at upward position (for the upward displacement and reference point). In this case the flux linking with secondary coil S_1 is more as compared to linking with S_2. Due to this e_1 will be more than of e_2. That is output voltage e_{out} is positive.

Case III : When the core is at downward position (for downward displacement) In this case magnitude of e_2 will be more as that of e_1. Due to this output will be negative and shows output e_{out} downward of reference point.



Pradnya Prashant Jadhav

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- शिक्षणमहर्षी डॉ. बापूजी साळुंखे

08156

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	

Suppliment No. : 1
Roll No. : 8533
Class : BSc - III

08
8/10

Subject: Electronics
Test / Tutorial No. : Internal Exam
Div. :

Q 1

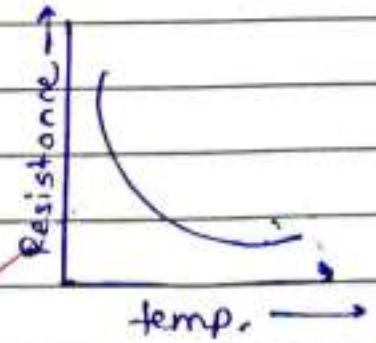
1) Passive

2) LVDT.

2

1) Thermister.

1) Thermister is a temperature sensitive device
2) If the temperature various, then the resistance of the termister either increases or decreases. By using the property we can use it as temperature sen son
3) semiconductors material are used in thermister prepared from oxide of chromium, cabalt, nicked, manganese are suphides of iron aluminium or copper.
4) Because of semiconductor, resistance of the thermistor various significantly with temperature co-efficient thermistor, positive temperature co-efficient thermister.
6) The characteristics of NTC thermister is more common, which is shown in fig.



The NTC thermister the resistance decreases as the temp. increases. according the following expression.

$R_T = R_0 e^{\beta (1/T - 1/T_0)}$

* features of thermistor thermometer.

① The typical size of a thermistor is 0.125 mm to 1.5 mm.

② The usefull range of temp. that we can get in thermistor is -100°C to +300°C

③ commercial available thermistor have the nominal values of 1k, 2k, 10k, 20k, 100k, etc.

④ Thermistors are availble in different type; bead type, rod type, disc type. etc.

2) construction and working of LVDT:-

construction :-

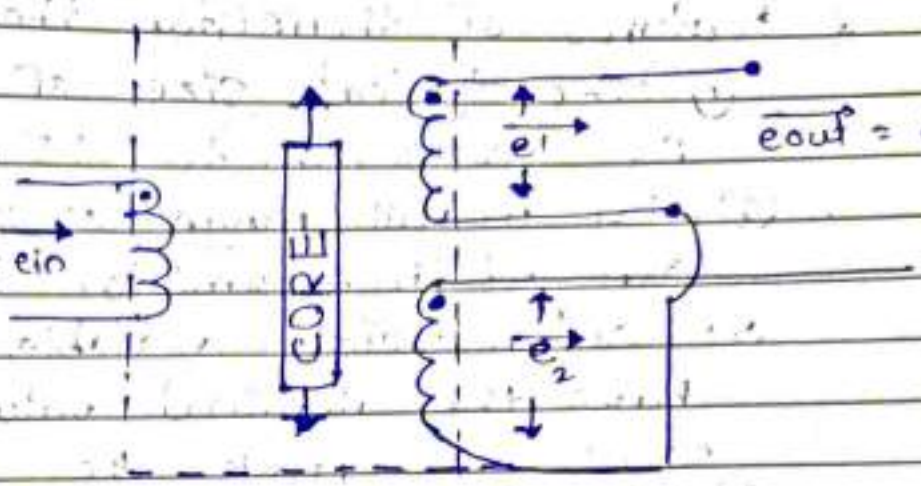
① The transformer consists of a primary winding P & two secondary wiading S1 & S2 wound on cylindrical former

② Both the secondary windings have equal number of turns & are identicalle placed on the either side of primary winding

③ A primary winding is connected to an AC source produces a Flux in the air gap & voltage are induced in secondary winding

④ A movable soft iron induced ~~In~~ core is placed inside the former and displacement to be measured is connected to the iron core.

working of LVDT :



* case I :-
when the core is at null position flux linking with both the secondary windings is equal so the induced emf is equal in both the winding so for no displacement the value of output e_{out} is zero as e_1 & e_2 both are equal so it shows that no displ took place.

* case II :-
when the core is moved to upward null position In this case the flux linking with secondary winding S_1 is more compared to flux linking with S_2 Due to this e_1 with be more as that of e_2.

* case III :-
when the core is moved to downward null position In this magnitude of e_2 will be more as that of e_1 due to this output e_{out} will be negative & shows that output to downward or reference point.

।। ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार ।।
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08305

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor

Suppliment No. :

Roll No. : 8369

Class : BSC - TY Sem - V

Subject : Electronics

Test / Tutorial No. : Internal Exam

Div. :

7/10

Q1

1 ~~Passive~~

2. ~~LVDT~~

Q2

1. Thermistor -

Thermistor is a temp sensetive device TF the temp varies then the resistance of the thermistor either increases or decreasps By using this property we can use it an a temperature sensor In thermistor the semiconductor materials are used.

Thermistor are classFied into two types are negotvie temperature coefficient Thermistor Positive temp coeefficient themistor. In NTc thermistor the resistance decreases as the temperature increases, according to the Following expression.

$$RT = R.\beta \left(\frac{1}{T} - \frac{1}{T_0}\right)$$

Features of Thermistor

① The typical size of a thermistor is 0.125 mm to 1.5 mm The usEul range of temperature that we can get in themistor is 100. (+300c commercial available thermistor have nominal valves of 1k .2k 10k, 20k, 100k, etc This valve indicates that the resistance value at the temperature of 25°C Thermistor are avaiable in different models bead type, rod type, dise type etc

Bridye circuit Formation using Thermistor →

When $R_T R_1 = R_2 R_3$, R_1, R_2, R_3 resistors are Fixed value resistors then the output voltage can be Varied due to chang in resitane R_T

$$VAB = \frac{RT}{RT+R3} * Vs \quad \& \quad VAD = \frac{R1}{R1+R2} * Vs$$

2. Construction and working of LVDT -

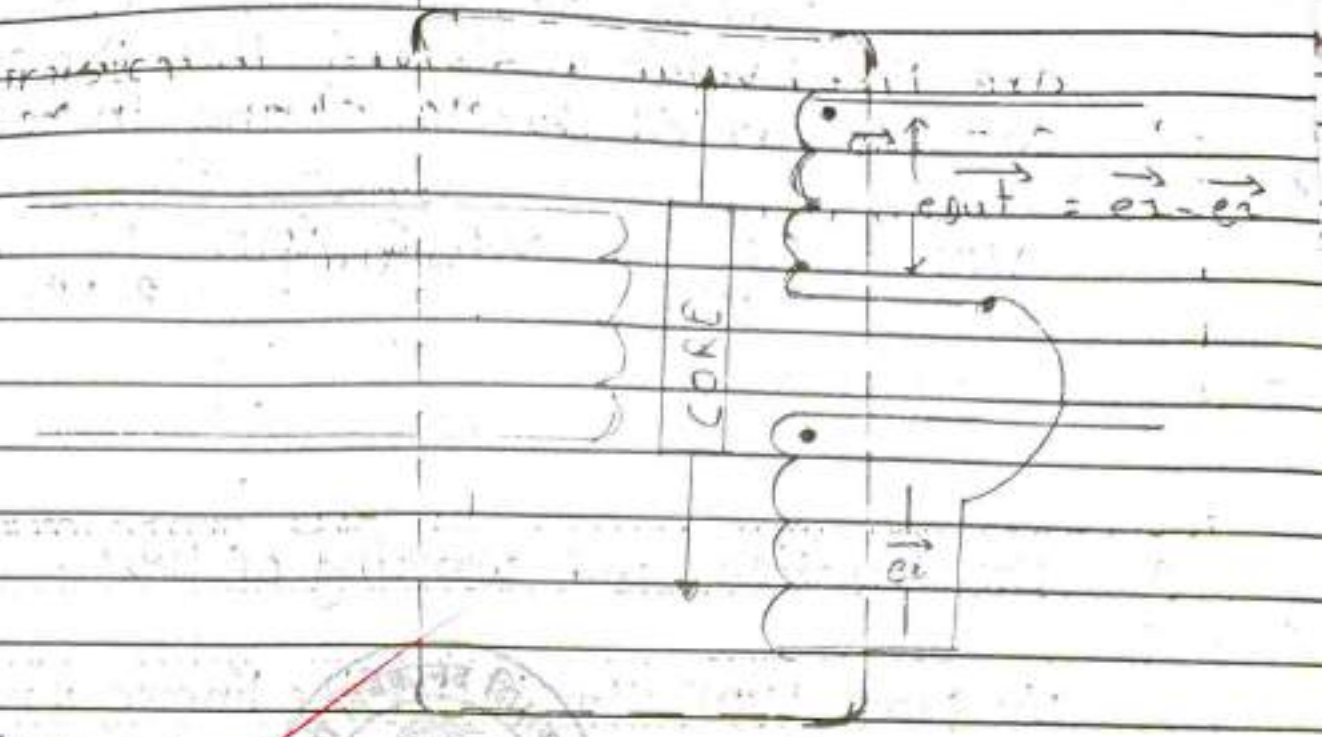
The term LVDT Stands for the linear variable differential transformer It the most widely used inductive transducer that convert the linear motion into the electrical signals

construction of LVDT -

Main Features of construction areas.

* The transformer consists of a primary winding P and two secondary winding S1 and S2 wound an a cytindrical former.
* Both the secondary winding S1 and S2 wound an turns and are identically placed on the either side of primary winding.
* The primary winding is connected to an Ac souree which produres a Flux in the air gap and voltages are induced in secondary winding.

Principle of Operation and Working. -



Working -

Case I - when the core is at null position when the core is at null position then the Flux linking with both the secondary Windings is equal so the enduced emf is equal in both the windings so For no displacemen the value of output eout as e_2 both are equal

Case II - When the case the Flux linking with secondary winding S1 is more as compared to Flux linking with S2

Case III - when the core is moved to downward of Null pasition displacement to the downward of reference point In this case magnitude of e_2 will be more as that of e_1

Ketan Ashok Kamble.

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SUPPLIMENT

Signature of Supervisor

Suppliment No. :

Roll No. : 8361

Class : BSc III

Subject : Electronic

Test / Tutorial No. :

Div. :

10/10

Q 1)

1) tranducers require external power source for their operation.

→

a) passive

2) Which of the following tranducers is used for displacement measurement ?

→

c) LVDT

Q 1)

1)

→ Thermistore -

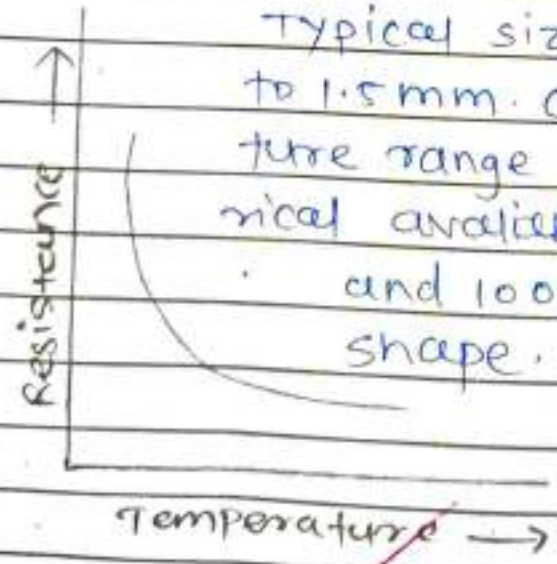
i) Thermistore is a sensetive divices.

ii) It is temperature varies, resistance of thermistore increses or decreses.

iii) In thermistor semi conductore materials are used.

iv) semi-conductor material are prepared from oxide, copper, nickel, magnese aluminimum the thermistore temperature varies ~~generally~~, significantly with temp more than normal resistance

The termistore classified into two types negative temeroature coeficient and positive temperature coeficient. In negative temperature in different thermistor, resistor decreses in. temperature increses According to following formula. $RT = Roef\left[\frac{1}{T} - \frac{1}{10}\right]$



Typical size of thermistor is 0.125 mm to 1.5 mm. connected to used temperature range is 7000°c to 3000°c commercial available in values 1K, 2K, 10K, 20K and 100K shape bead shape rood shape.

↑ dvandage - The thermistor raditively low cost and small size.

2)

→ LVDT

construction :- The main features of construction area. The Transformer the primary winding P and two secondary winding S1 and S2 would on cylindrical former.

1) The secondary winding is equal to the number of turns and identically placed in primary winding.

ii) The primary winding is connected to Ac source and ~~so~~ Ac soureed produce flux in air gap and voltage included in secondary winding.

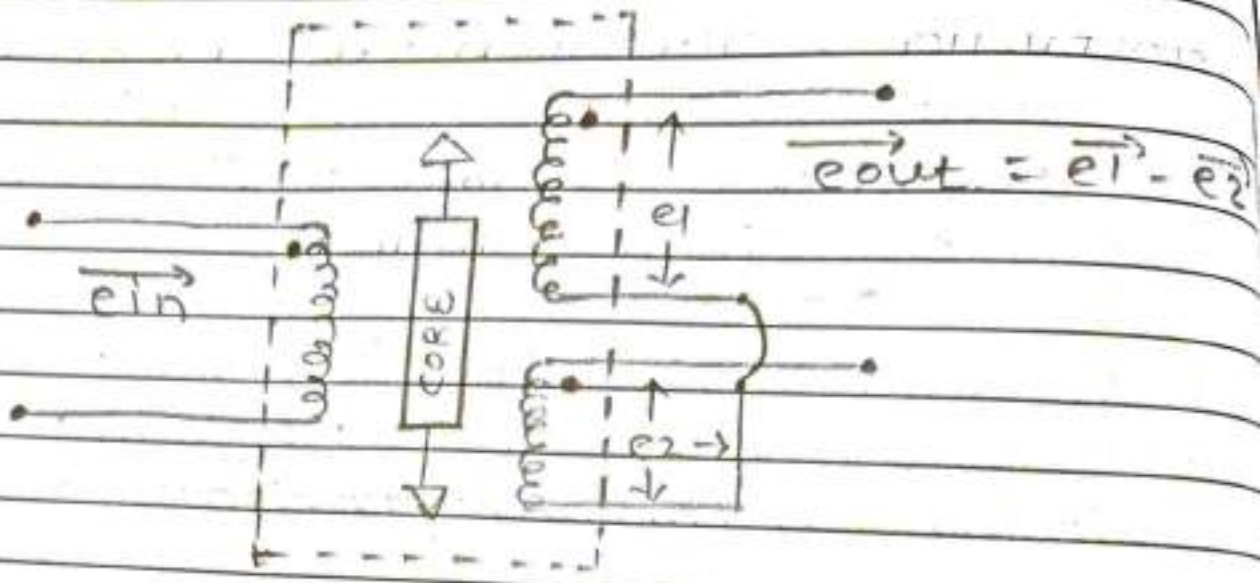
iii) The movable soft iron core is inside in the core and displacement in iron core.

principle Operation -

The primary winding is connected to Ac sources and produce voltage secondary wdt in secondary windings S1 is equal to e1 and S2 is equal to e2.

The output voltage is,

$$V_{out} = e_1 - e_2$$



Working :-

Case I): when the core is an null position (No displacement) then the flux linking with the both secondary windings equal then the included emf is equal in both the winding so no displacement the value of eout is zero the e1 and e2 both equal. It is shows no displaceme to place.

CaseII):

when the core is an upward direction displacement upward toresistance point. then the flux linking with the secondary winding s1 is more as compared to flux linking with s2. Due to e1 is more as compared e2. Due to eout is positive.

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Roll No. : 8361

Class : BSc III

Subject : Electronic

Test / Tutorial No. :

Div. :

Case III):

When the core is an downward direction (Displacement downward to reference point) then the flum of maghitued of e2 due to this eout will be negative and shows the output downward to reference point.

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SUPPLIMENT

Signature of Supervisor	

Suppliment No. :

Roll No. : 8358

Class : BSc TY sem V

Subject : Electronics

Test / Tutorial No. : Internal Exam

Div. :

16/16

Q.1)

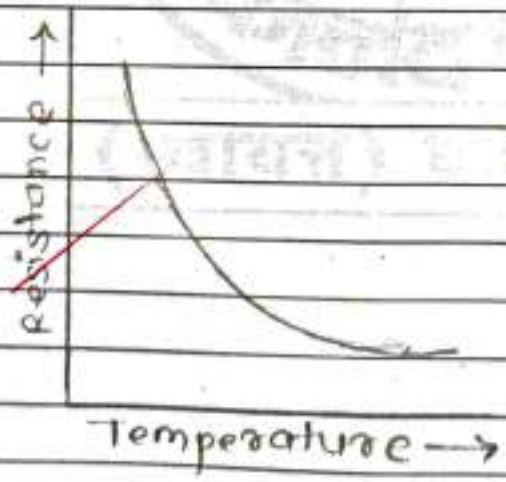
1) Passive transducers requires external power source for their operation.

2) LVDT

Q.2)

1) Thermistor

1) Thermistor is the temperature sensitive device.
2) If the temperature varies, then the resistance of the thermistor either increases or decreases.
3) By using this property, we can use it as a temperature sensor.
4) In thermistor, the semiconductor materials are used. Because of semiconductor, resistance of the thermistor varies significantly with temperature, more than the normal resistance.
5) Thermistors are classified into two types.
Negative Temperature Coefficient Thermistor
Positive Temperature Coefficient Thermistor.
6) Features of thermistor thermometer



Typical size = 0.125 mm to 1.5 mm
Temperature range = 100°C to 300°C
Models = bead type, rod type, disc type

PTO

Advantages : Low cost
small size.

Formula : $R_T = R_o e^{B(1/T - 1/T_o)}$

2) LVDT

LVDT stands for Linear Variable Differential Transducer.

It converts the linear motion into the electrical signals.

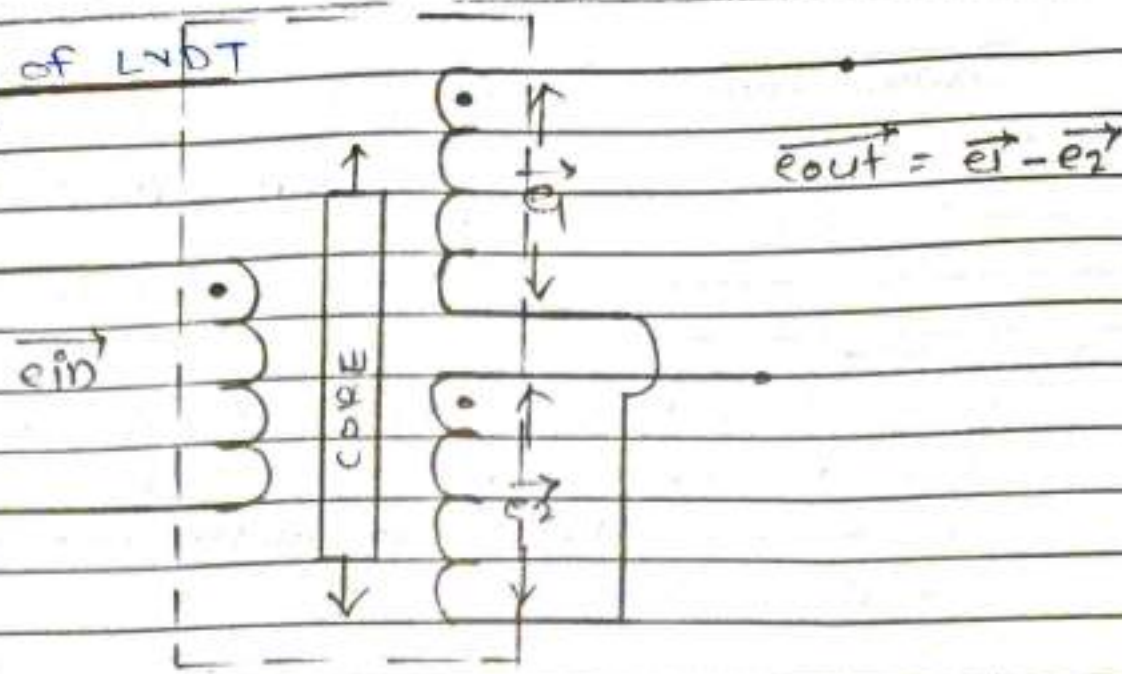
Construction of LVDT

Main features of LVDT

1) The transformer consists of a primary winding P1 and two secondary winding S1 and S2 wound on a cylindrical former.
2) Both the secondary windings have equal number of turns and are identically placed on the either side of primary winding.
3) The primary winding is connected to an AC source which produces a flux in the air gap and voltages are induced in secondary winding.
4) A moxable soft iron core is placed inside the former and displacement to be measured is connected to iron core.

PTO

Working of LVDT



Case I: When the core is at null position

When the core is at null position then the flux linking with both the secondary winding is equal so the induced emf is equal in both the winding so it is shows that no displacement took place.

Case II: When the core is moved to upward of null position

In this case, the flux linking with secondary winding S1 is more as compared to the linking with S2. Due to this e_1 will be more as that of e_2. Due to this output voltage e_{out} is positive.

Case III: When the core is moved to doward of null position.

In this case, magnitude of e_2 is will be more as that of e_1. Due to this, output will be negative and shows output downward of reference point.

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Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

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SUPPLIMENT

Signature of Supervisor	

Suppliment No. :

Roll No. : 8390 — 10/10

Class : BSc III

Subject : Electronics

Test / Tutorial No. : Internal Exam

Div. :

Q 1

1 Passive ✓

2 LVDT ✓

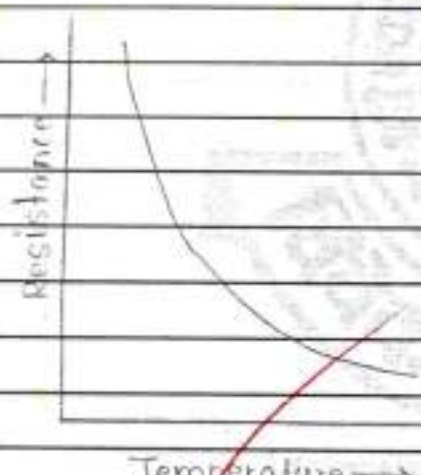
2 ✓

Q.2

1 Thermistor -

Temrmistor is a temp. sensetive device IF the temp varies then the resistance of the thermistor either increases or decreases By using this property, we can use it is on a temperature sensor In thermistors the semiconductor materials are used

Thermistor are classified into two types are negative temperature coefficient Thermistor, Positive temp. coefficient thermistor. In NTC thermistor the resistance decreases as the temperature increases, according to the following expression



$$R_T = R_0 \beta \left(\frac{1}{T} - \frac{1}{T^\circ}\right)$$

Features of Thermistor Thermometer -

① The typical size of a thermistor is 0.125 mm to 1.5 mm. The useful range of temperature that we can get in thermistor is $100^\circ C + 300^\circ C$ commercial available thermistors have nominal values of 1K, 2K, 10K, 20K, 100K etc This value indicates that the resistance value at the temperature of 25°C. Thermistors are available in different models · bead type, rod type, disc type etc

Bridge circuit formation using Thermistor -

When $R_T R_1 = R_2 R_3$. R_1, R_2, R_3 resistors are fixed value resistors then the output voltage can be varied due to change in resistance R_T.

$$V_{AB} = \frac{RT}{R_T + R_3} * Vs \quad \& \quad V_{DD} = \frac{R_1}{R_1 + R_2} * Vs$$

→2 Construction and working of LVDT-

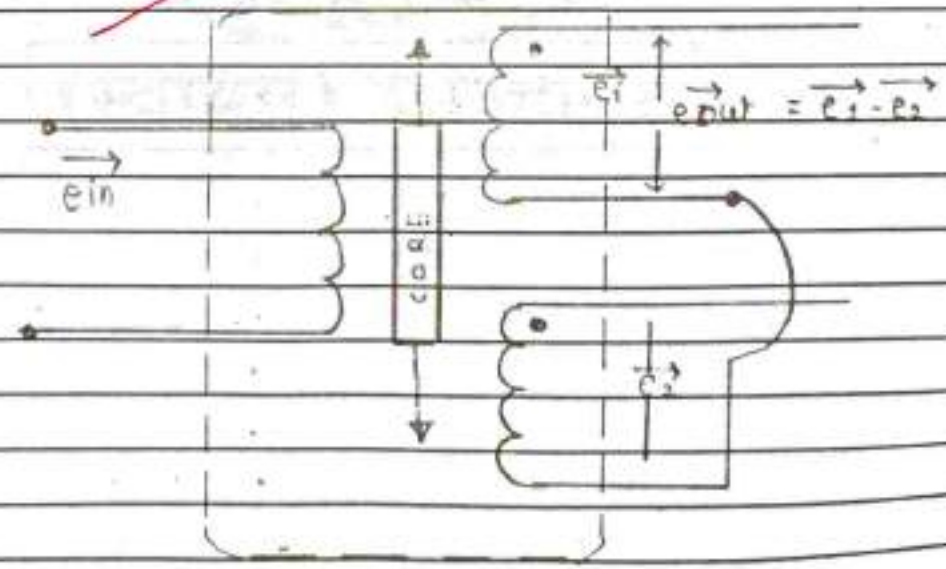
The term LVDT stands for the linear variable differential transformer it the most widely used inductive transducer that convert the linear motion into the electrical signals

Construction of LVDT -

Main features of construction areas,

- The transformer consists of a primary winding P and two secondary winding S1 and S2 wound on a cylindrical former
- Both the secondary windings have equal no of turns and are identically placed on the either side of primary winding
- The primary winding is connected to an AC source which produces a flux in the air gap and voltages are induced in secondary winding

Principle of Operation and working-



Working -

Case I - When the core is at null position when the core is at null position then the flux linking with both the secondary windings is equal. So the enduced emf is equal in both the windings. so for no displacement the value of output emf as e_1 and e_2 both are equal

Case II - When the core is moved to upward of null position. In this case the flux linking with secondary winding S_1 is more as compared to flux linking with S_2

Case III - When the core is moved to downward of Null position displacement to the downward of reference point) In this case magnitude of e_2 will be more as that of e_1

Vrushali Umesh Ropalkar

।। ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार ।।

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Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	10/10

Suppliment No. :

Roll No. : 8370

Class : BSC III

Subject : Electronics

Test / Tutorial No. : Internal Exam

Div. :

Q.1

1. Ground wave propogation involve a radio signal that travels a long the surface of the earth

2. The widely used shape for path antenna is Rectangular

2

Q.2

4. Define the following terms.

→ a) Critical Frequency - It is highest frequency that returns to the ground after reflection from the ionosphere layer when transmitted vertical

b) maximum usable Frequency - This is a limiting frequency at the specific angle of induce other than the vertical which can be used for the sky wave propagation.

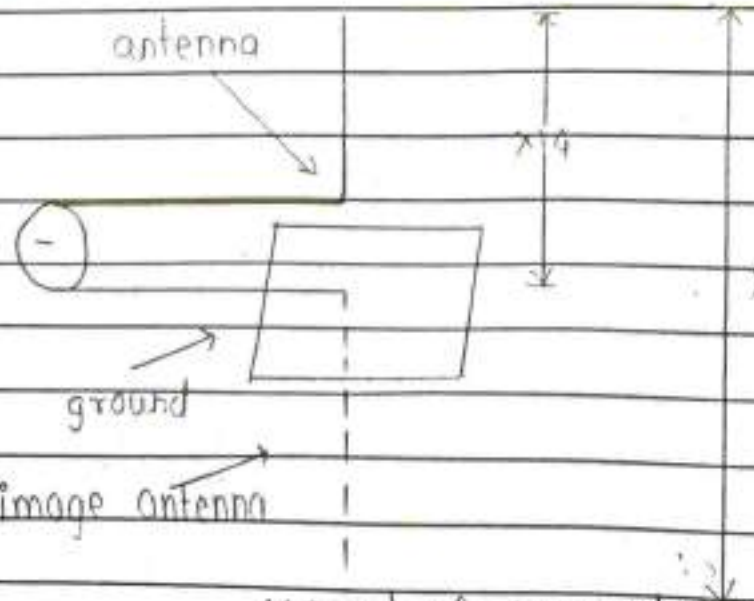
c) Skip distance - The skip distance is defined as the minimum distance from a transmit antenna that a sky wave at a given frequency will be returned to earth

4

d) Vertual height - When a wave refracted it is bent down gradually, but not sharply. However the path of incident wave and reflected wave are same if it is reflected from a surface located at a greater height of this layer. Such a greater height is termed as virtual height.

2 Monopole antenna - A monopole antenna is a class of radio antenna consisting of a straight rod-shaped conductor often mounted perpendicularly over some type of conductive surface called a ground plane. A monopole antenna is a half a dipole antenna placed on top of a ground plane as shown fig. The driving signal from a transmitter is applied, or for receiving antenna the output signal to receiver is taken between the lower end of the monopole and the ground plane one side of the antenna feedline is attached to the lower end of the monopole often the earth. In constructs with a dipole antenna which consists of two identical rod conductors, with a signal from the transmitter applied between the two halves of the antenna.

Assuming the plane is infinite and perfectly conducting the monopole antenna will be equivalent to a dipole whose lower half is the image of the upper half. It is found that for a monopole antenna like a quarter wavelength vertical the ground acts as a plane to reflect the radio waves so that an image of the top half of the antenna is seen in the earth.



concept of monopole antenna.

The current and charges on the monopole are the same as on the upper half of it's dipole counterpart but the terminal voltage is only half that of the dipole.

$$\therefore Z_{A.mon\,O} = \frac{V_{A.mon\,O}}{I_{A.mon\,O}} = \frac{1/2\ A\ dipole}{1A.\ dipole} = \frac{1}{2} Z_A\ dipole$$

The directivity of a quarter wave monopole is twice, half of a half wave dipole in free space.

$$D = 2(1.64) = 3.28 = 5.16\ dB$$

The radiation pattern for the monopole is shown in fig

Ajay Mohan Suryavanshi

।। ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार ।।

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VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	9/10

Suppliment No. : 1

Roll No. : 8509

Class : BSc- III

Subject : Electronics

Test / Tutorial No. : Internal

Div. :

Q 1

i) Ground wave propogation involves a radio signal that travels along the surface of the earth

ii) The widely used shape for patch antennas is Rectangular

2

Q 2

4)

a) Critical Frequency :-

It is height frequency that returns to the ground after reflection from inosphere layer when transmitted ~~horizontally~~ vertical. After this frequency the ray will not bend towards the earth and no communication takes place.

b) Maximum Usable Frequency (MUF):-

This is a limiting frequency at the specific angle of incidence ~~and~~ other than the vertical, which can be used for the sky wave propogation.

c) Skip Distance :-

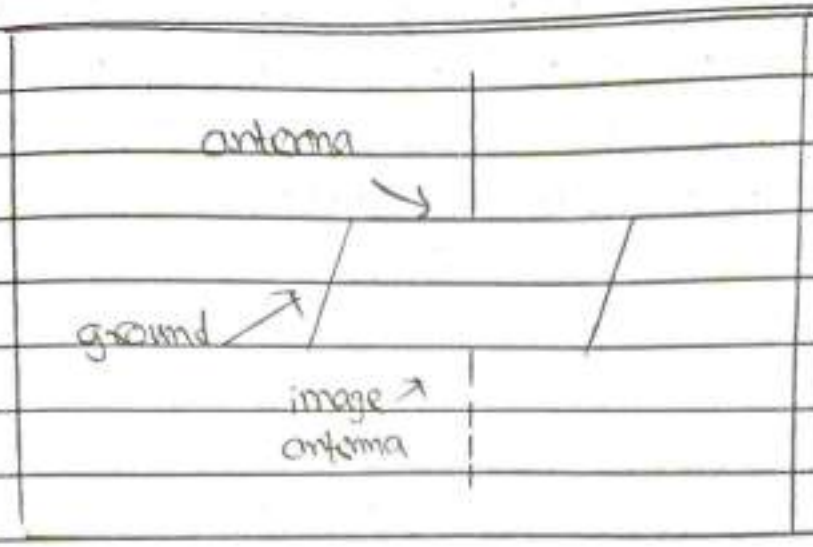
The skip distance is the distance from the transmitter to the point where the sky wave first returns to the earth.

4

d) Virtual Height :-

When a wave is refracted, it is bent down gradually but not sharply. However, the path of incident wave and reflected wave are same if it is reflected from a surface located at a grater height of this layer. Such grater height is called as virtual height.

2)



i) Monopole antenna is class of the antenna consisting of straight and rod shaped conductor often mounted perpendicular over some type of conductive surface called a ground plate.

ii) A monopole antenna is half of dipole placed on top of ground plate as diagram.

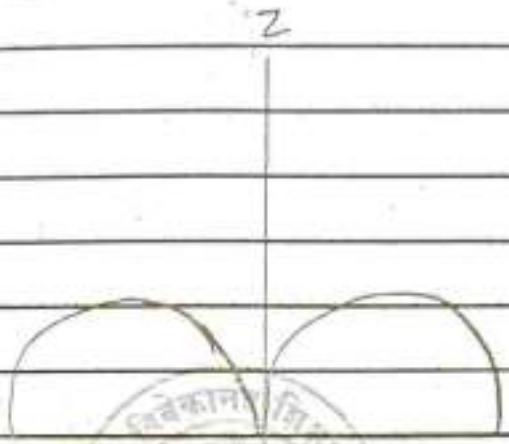
iii) The diving signal from the transmitter is applied for receiving antenna output signal to the receiver is taken between lower end of monopole and the ground plane.

iv) One side of the antenna feedline is attached to the lower end of the monopole and the other side is attached to the ground plane which is often the earth.

v) This contrast with dipole antenna which consists of two indentical rod conductors with the signal from the transmitter applied between the two halves of the antenna.

vi) Assuming the planes is infinite and perfectly conducting the monopole antenna with be equalent of the dipole antenna.

vii) It is found that a monopole antenna like as plane quarter wavelength vertical, the ground acts as plane reflect the radio waves so that an image of half antenna seen to be earth.



Name!- Nikhil Sunil Patil

" ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार "

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Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	09/10
Suppliment No. : 1	Subject : Electronics
Roll No. : 8367	Test / Tutorial No. : Internal exam.
Class : BSc III	Div. :

Q.1 i) Groundwave propagation involves a radio signal that travels along the surface of the earth

ii) The widely used shape for patch antennas Rectangular

Q.2 4]

a] Critical frequency :-

It is the hight frequency that turn to the ground after reflection from ionosphere layer when transmitted vertically. After this frequency the ray can not bend towards earth

Critical frequency is

$(fc) = \sqrt{81 N_{max}} = 9\sqrt{N_{max}}$.

b] Maximum usable frequency :- (MUF)

This is limitting frequency at the specific angle of incidence other than the vertical which can be used for the sky wave propagation

$MUF = fc/\cos i = fc \cdot \sec i$.

c] Skip distance :-

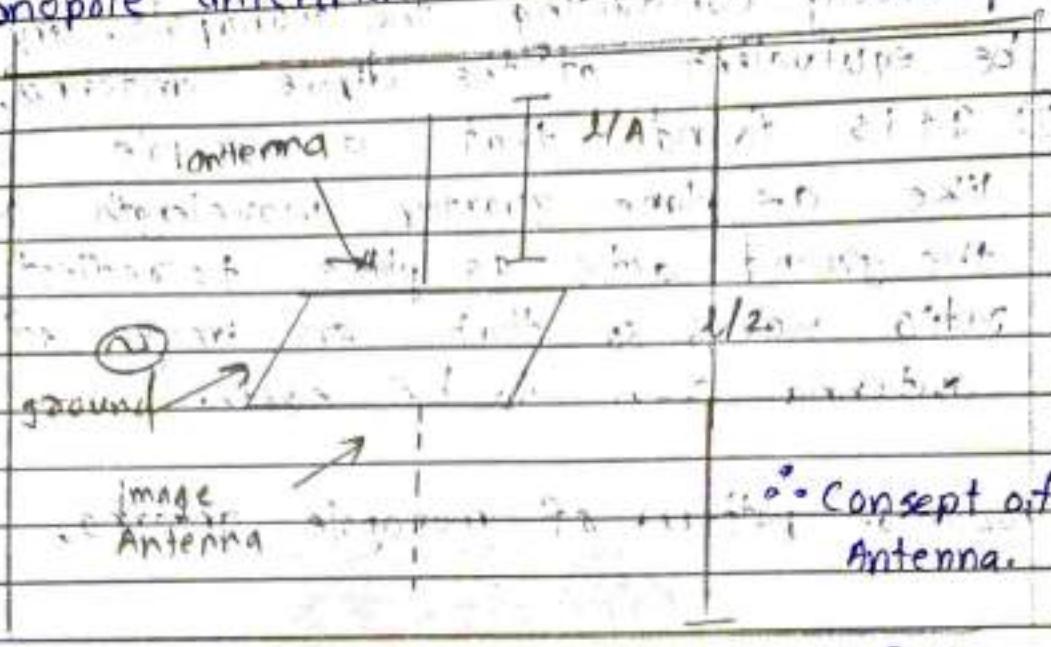
Skip distance It is defined as the maximum distance from the transmit antenna that a sky wave at a given frequency will be returned to earth.

d] Virtual Hight :-

The maximum height that this hypothetical wave would have reached is the virtual height. wave is reflected bend down. groudully but not sharply the path of incident wave and reflected wave sam such greater hight is called Virtual hight.

Q.2

② Monopole antenna:-



Consept of monopole Antenna.

① A monopole antenna is class of the antenna consisting of straight rod shaped conductor often mounted perpendicular over some type of conductive surface called a ground plate

② A monopole antenna is half of dipole placed on top of ground plate as diagram.

③ The driving signal from the transmitter is applied or for reciving antenna output signal to the reciver is taken between lower end of monopole and the ground plane.

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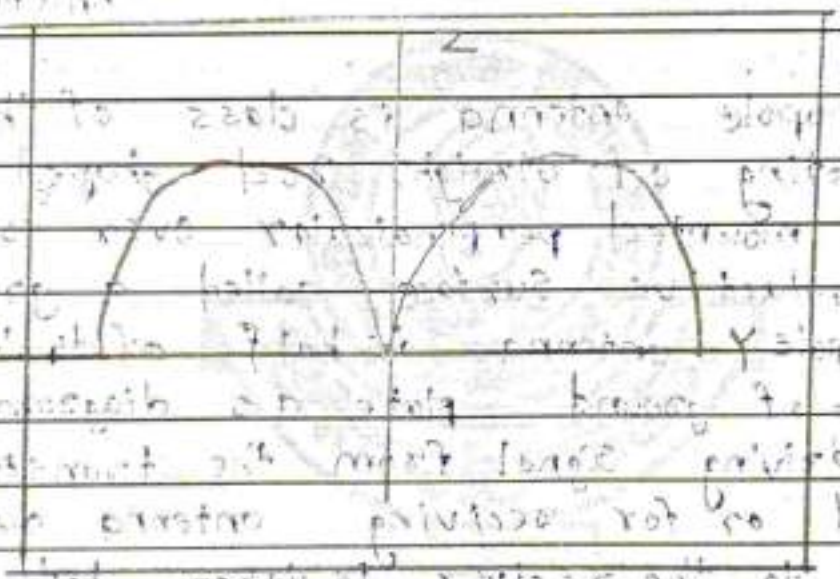
⑤ This constrast with dipole antenna which consists of two indential rod conductors with the signal form the transmitter applied between the two inverse of the antenna.

⑥ Assuming the planes is infinite and perfectly conducting the monopole antenna will be equivalent of the dipole antenna.

⑦ It is found that a monopole antenna like as plane quarter wavelength vertical the ground acts as plane to reflect the radio waves so that an image of half antenna seen to be earth.

* Radiation pattern of monopole antenna.



Name : Aniruddha Vitthal Patil.

"ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार"
-शिक्षणमहर्षी डॉ. बापूजी साळुंखे

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	8/10/Jn

Suppliment No. :

Roll No. : 8366

Class : BSc III

Subject : Electronics

Test / Tutorial No. : Internal exam (Antenna & wave Propagation)

Div. :

Q.1)

i) Ground wave propagation involves a radio signal that travels along the surface of the earth.

ii) The widely used shape for patch antennas is rectangular

Q2] 4] Define the following terms.

a] critical energy :→ It is the height frequency that turns to the ground after reflection from Inosphere layer when trasmitted vertically. After this frequency the ray can not bend towards earth. critical frequency (fc) $\sqrt{81 N_{max}} = 9\sqrt{N_{max}}$.

b] maximum USABle frequency :→ This is limiting frequency at the specific angle of incidence other than the vertical which can be used for the sky wave propogation.

$muf = fc / \cos i = fc \cdot \sec i$

c] Skip distance :→ It is defined as the minimum distance from the transmit antenna that a sky wave of a given frequency will be returned to earth

d] Virtual height :→

The maximum height that the hypothetical wave would have reached is the virtual height.

Q1]

2] antenna.

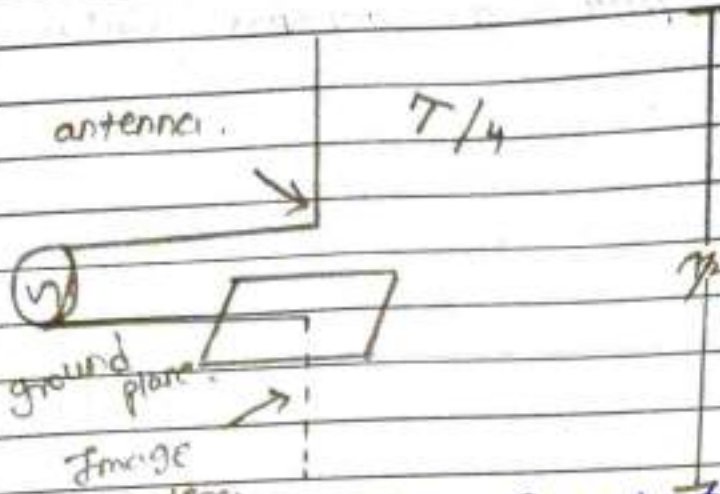


fig. Concept of monopole antenna.

1] The monopole antenna is class of the antenna consisting of straight rod shaped conductor. often mounted perpendicular over some type of conductive surface called a ground plane.

2] A monopole antenna is half of dipole placed on the top of the ground plate. as shown in fig.

3] The driving signal from the transmitter is applied or for receiving antenna out put signal to the receiver is taken betn lower end of monopole and the ground plane.

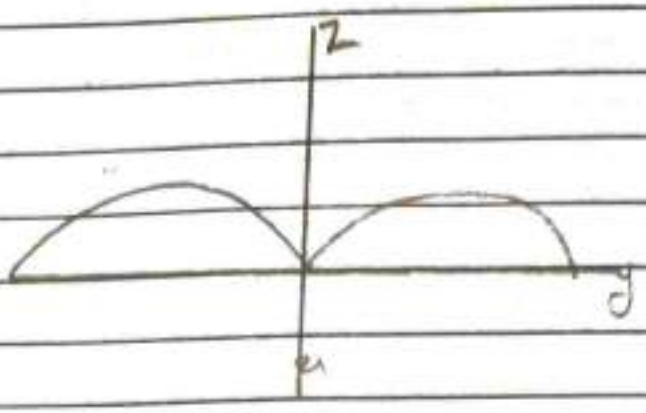
4] one side of the antenna feedline is attached to the lower end of the monopole and the other side is attached to the ground plane which is often the earth.

5] This contrast with dipole antenna which consists of two identical rod conductors with the signal form the transmitter supplied betn the two halves of the antenna.

6] Asuming the plane is infinite and perfectly conducting the monopole antenna will be equivalent to a dipole antenna

7] It is found that for a monopole antenna like a quarter wavelength vertical the ground acts as plane of reflect the radio waves so that an image of half the antenna seen to be earth.

* Radiation pattern of monopole antenna. →



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SUPPLIMENT

Signature of Supervisor: 7/10/2

Suppliment No. : 1

Roll No. : 8521

Class : BSc. III

Subject : Electronics

Test / Tutorial No. :

Div. :

2+2+3 = 7

Q.1

i]

→ c) Ground Wave

ii]

→ A) ~~rectangular~~

2

Q.2

1.

→ micro. pacth antenna called patch antenna to high performar aircraft satare araft scale lite and missile application where size weight cost performance ease of installa -tion of antenna may require microstrip patch antenna also very popular in the field of mobile communication patch antenna are usually used within the frequency range of 2-11 GHz.

A microstrip antenna a generally consist of dielectric substance sandwiched beetween a radiating patch on the top and a ground plane on the other side as shown in fig the patch is made of conducting materials such as copper or gold and can take any possible shape.

2.

→ the frequancy range wave propagation

Q.4

a) critical Friquency : (Fc)

it is the highest frequency that return to the group after reflection from the inusphere layer when transmitted vertical

$$Fc = \sqrt{81 N max} = 9\sqrt{N max}$$

b) maximum usable frequency (MUF) :-

this is the limiting frequency at the specific angle of incidence other than the vertical which can be used for the sky wave propagation

3

$$MUF = \frac{Fc}{\cos \theta i}$$

$$MUF = Fc \cdot \sec i$$

c) skip distance

the skip distance is the distance from the transmitter to the point A where the sky wave propagation

Q.3

→ Ground wave pripagation :-

Frequency range :- 30 MHz