S.S.P.Mandal Tehu's

Rani Laxmibai Mahavidyalaya Parola

Parola (Dist-Jalgaon)

NAAC Accredited 'B' Grade

CERTIFICATE

Student's Name Nikam Harshal Aadhar.

Std T.Y.BSC.

Class T.Y.BSC. Division _____

This is to certify that experiment's written in the index has been performed by the student satisfactorify.

Internal Examiner 21/3/17

Teacher's Signature 11/3/17

External Examiner 21/3/17

Head of the Department 11/3/17

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Head of The Deparment

S.S.P.Mandal Tehu's

Rani Laxmibai Mahavidyalaya Parola

Department of Physics

Name : Nikam Harshal Aadhar. Lab. No.

Batch Date 1 /20 Expt. No. 1

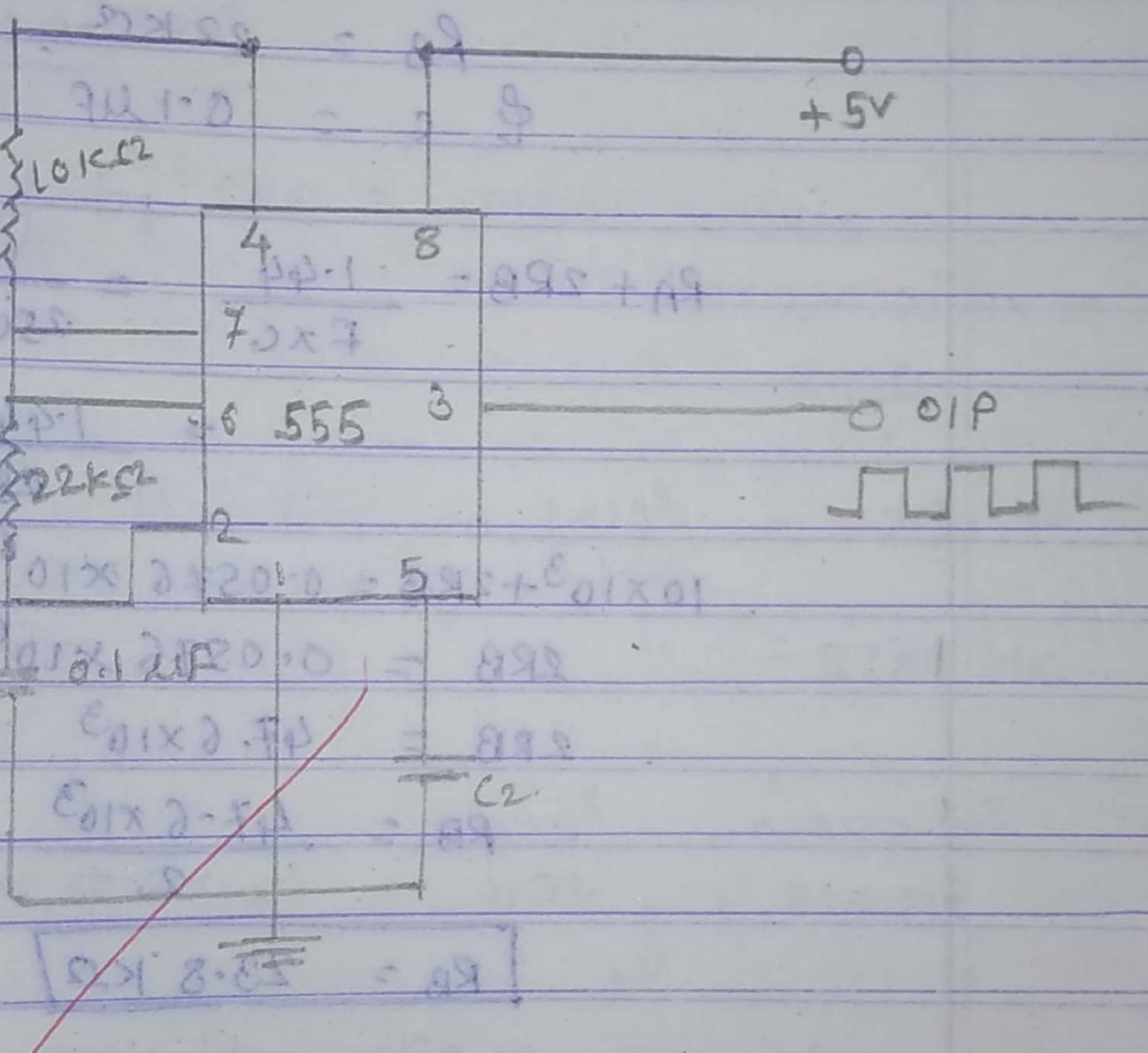
Title Astable multivibrator using IC-555

Aim :-

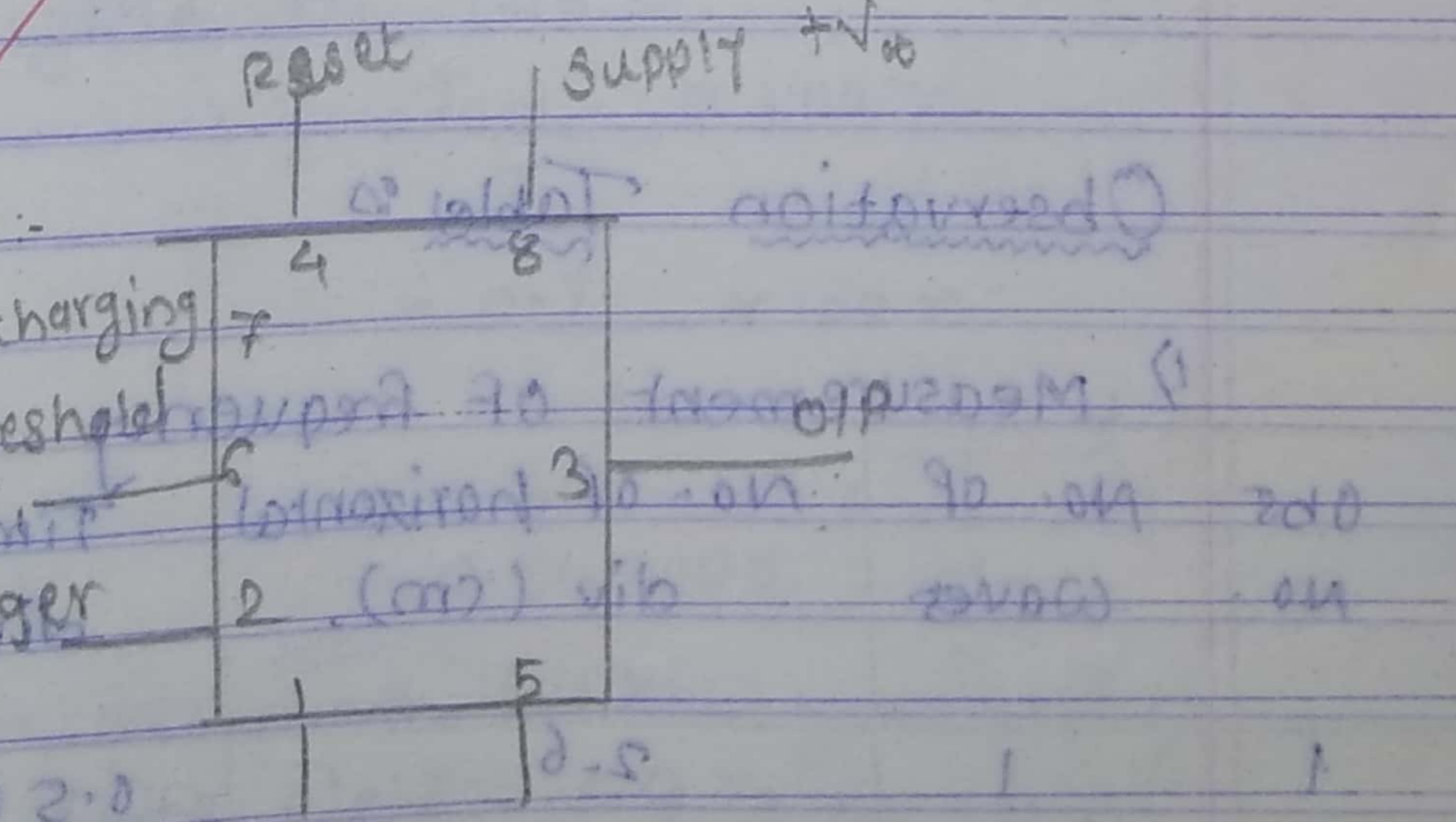
To determine build and tests on astable multi-viberator using IC-555

App :- IC-555, resistor, capacitor, CRO, 5v dv, power supply, etc.

Fig :-



Observations :-



Pin - Configuration

Incomplete for
Observation
Calculation
Graph
Figure
Procedure
General

Designing :-

Designe the astable multivibrator for frequency 250 Hz.

The frequency of astable multivib

$$f = \frac{1.44}{(R_A + 2R_B).C.}$$

Given = $F = 250\ Hz.$

assume, $C = 0.1\ \mu F = 0.1 \times 10^{-6}\ F.$

Let $R_A = 10 \times 10^3\ \Omega$

$R_B = 22\ K\Omega$

& $C = 0.1\ \mu F$

$$R_A + 2R_B = \frac{1.44}{f \times C} = \frac{1.44}{250 \times 0.1 \times 10^{-6}}$$

$$= \frac{1.44 \times 10^6}{250}$$

$$10 \times 10^3 + 2R_B = 0.0576 \times 10^6.$$

$$2R_B = 0.0576 \times 10^6 - 10^3 \times 10$$

$$2R_B = 47.6 \times 10^3$$

$$R_B = \frac{47.6 \times 10^3}{2}$$

$$\boxed{R_B = 23.8\ K\Omega}$$

Observation Table :-

1) Measurement of frequency by CRO :-

Obs No.	No. of waves	No. of horizontal div (cm).	Time/div	Frequency (Hz)
1	1	2.6	0.5 ms	769
2	1	2.6	0.2 ms	757

2] Duty ~~cycle~~ cycle by CRO ⇒

1) No. of div frequency for T_{ON} = 1.4	Time/Div = 0.5 ms	$T_{ON} = 0.7 \times 10^3$ = 0.7 ms.
2) No. of div = 2.6	Time/Div 0.5 ms	T = 1.3 ms.

Duty cycle is = 54 %.

Calculation ⇒

1) Frequency by CRO = $\frac{\text{No. of waves}}{\text{No. of horizontal div} \times \frac{\text{time}}{\text{Div}}}$ = Hz

$f = \frac{1}{2.6 \times 0.05 \times 10^{-3}} = \frac{1 \times 10^3}{1.32} = 0.769 \times 10^3$

= 769 Hz.

$f = \frac{1}{6.6 \times 0.2 \times 10^{-3}} = \frac{1 \times 10^3}{1.32} = 0.75 \times 10^3$

= 757 Hz.

2) Duty cycle by CRO ⇒ $\frac{T_{ON}}{T} \times 100\%$.

$= \frac{0.7}{0.3} \times 100\%$.

$= 0.54 \times 100$

= 54 % Duty cycle

Designing ⇒

1) Value of R_B = Let $f = \frac{1.44}{(R_A + 2R_B).C}$

consider $R_A = 1K\Omega$, $C = 0.01\mu F$, $f = 710$ Hz.

$$1\times10^3 = \frac{1.44}{(1\times10^3 + 2R_B)\times0.01\times10^{-6}}$$

By solving above equation for R_B, we get $R_B = 100\ K\Omega$

Required value of R_B to connecting circuit $B = 100\ \Omega$

ii) Duty cycle :-

Let $D = \frac{R_A + R_B}{R_A + 2R_B} \times 100\%$

$$= \frac{1\times10^3 \times 100\times10^3}{(1\times10^3) + 2\times100\times10^3} \times 100$$

$$= \frac{100\times10^3}{1+200\times10^3} \times 100\% = \frac{101}{201} \times 100\%$$

$$= 0.00049 \times 100\% = 49\%$$

$D = 0.5 = 50\%$.

Theory :- An astable multivibrator is called for runing multivibration is a reaitangular wav generating circuit unlike the monostable multivi This ckt does not require any external trigg changes the state of O/P. Hence the name free runing. An astable multivibrator can be produce by adding resistance & a capacitor to the bas timmer IC as illustrated in fig. The timi during which the output is either high or low i determined by externally connected resistor & capacitor.

Results :-

1) Desinged value for frequency of astable multivibrator = 100 Ω
2) Frequency Obtained from CRO = 769 Hz.
3) Duty clele from ciruit value = 50 %.
4) Duty cycle is obtained from CRO = 54%.

S.S.P.Mandal Tehu's

Rani Laxmibai Mahavidyalaya Parola

Department of Physics

Name : Nikam Harshal Aadhar Lab. No.

Batch Date / /20 Expt. No. 2

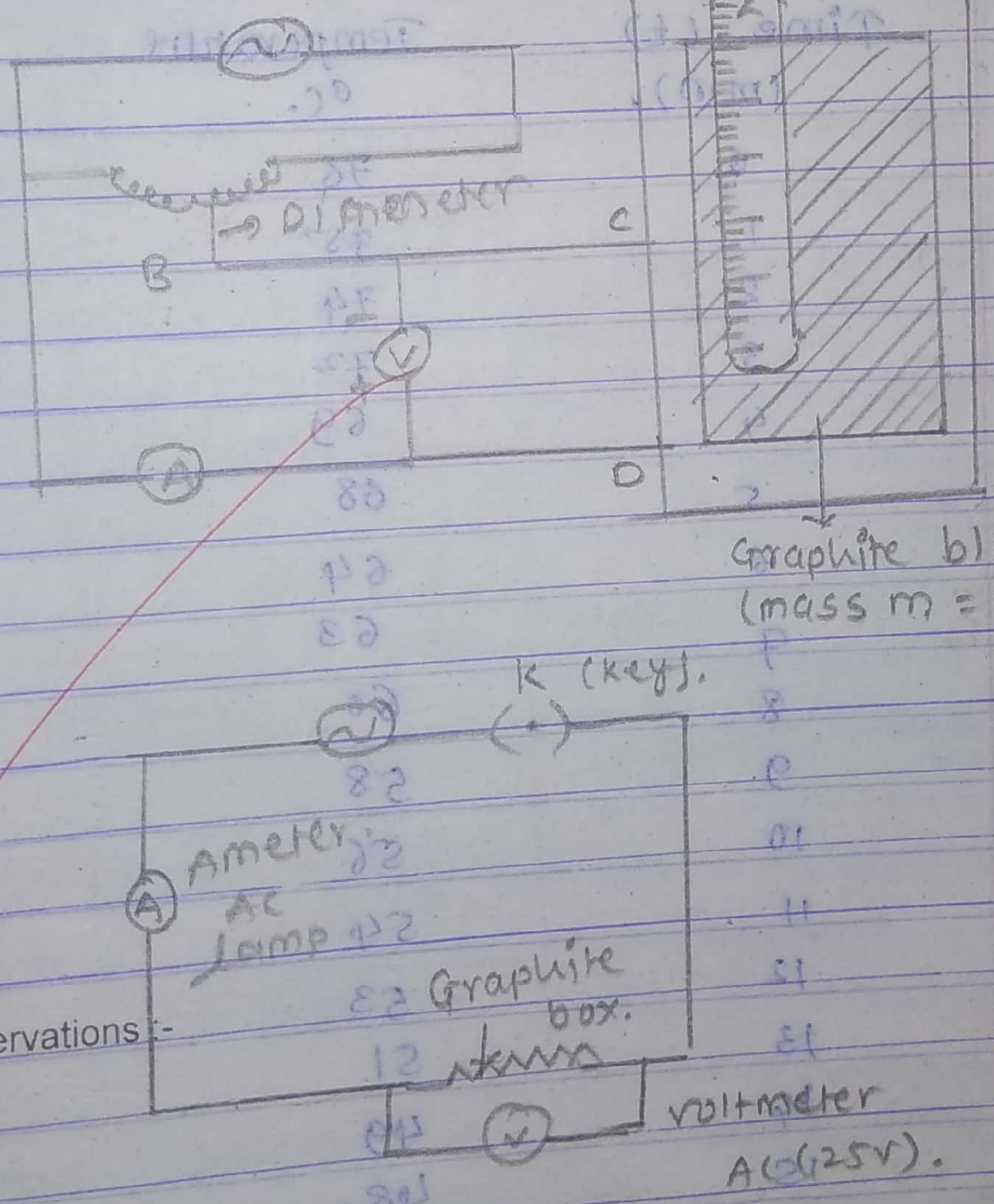
Title Specific heat of Graphite

Aim :-

To determine the specific heat of graphite at different temperature.

App :- Specific heat kit, Diameter, voltmeter, ammeter, thermometer, etc.

Fig :-



Observations :-

Observations :-

i) Mass of graphite block (M) = 220 gm

ii) Joule's Constant J = 4.2 Joules

Observation

Calculation

Graph

Figure

Procedure

General

Observation Table :-

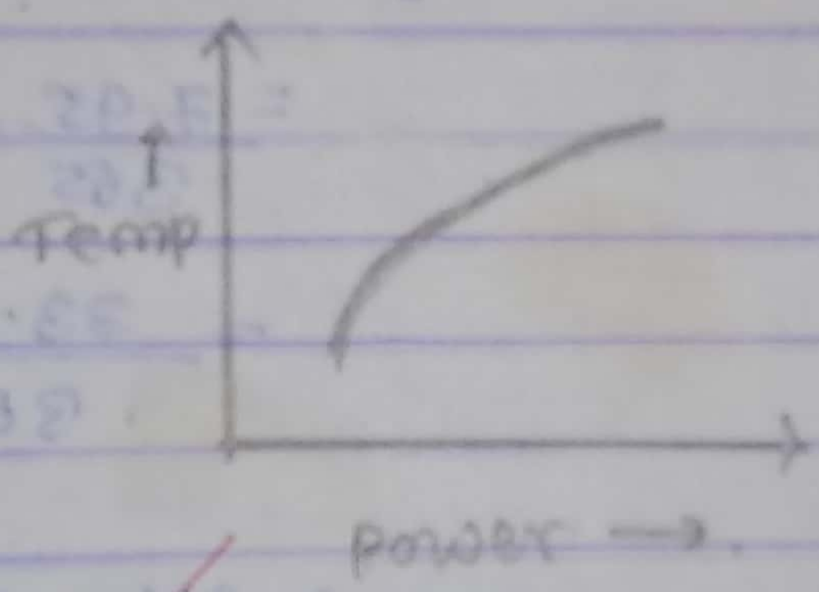
Obs No	current I (mA).	voltage, V (volt).	Equillibrium temp °C.	Power
1)	$I_1 = 0.53$	$V_1 = 15V$	60°	7.95
2)	$I_2 = 0.68$	$V_2 = 17V$	70°	11.56

$V = 20V$ & $I = 0.7A$

Obs No	Time (t) (min).	Temperature °C.
1	0	78
2	1	75
3	2	74
4	3	72
5	4	69
6	5	68
7	6	64
8	7	63
9	8	60
10	9	58
11	10	56
12	11	54
13	12	53
14	13	51
15	14	49
16	15	48.

Experimental Procedure :-

1) connect the circuit as shown in fig. with paper ammeter galvanometer.
2) Power supply value to the later 25 v with the help of diananerstand as a unit an equilibrium dipole attained. The note down value of current temp. with help of thermometer.
3) Now increases the voltage of dimeter state from 20 % to 25 volt obtained required equilibrium temperature circuit. This voltage is note down. the given voltage and current In the circuit for graph shows equilibrium. Obtain corresponding to power supplies to the heater.



4) Similarly, Note down the equation of equilibrium for heater voltage varries in steps
5) About six eq^n temp of tabular data as shown in Fig in table (1).
(6) Provide the heater will fullfill power i.e. zero volt allows the block the heat unit equation temperature is released. This temp will be granual 50.00°c Switch off heater.
(7) Plot the graph between specific heat is the temperature graph shows variation of specific heat.

Calculation :-

Formula :-

$P = VI$

specific heat $= S = \frac{VI}{m(\text{slope})Q}$

i) $P_1 = V_1 I_1 = 15 \times 0.53 = 7.95$ k.

ii) $P_2 = V_2 I_2 = 17 \times 0.08 = 11.50$ k.

iii) $S_1 = \frac{V_1 I_1}{m(\text{slope})Q} = I$ cal/gm °C

$= \frac{15 \times 0.53}{220 \times (1.66)} \times 4.2$

$= \frac{7.95}{365} \times 4.2$

$= \frac{7.95}{365} \times 4.2$

$= \frac{33.39}{365}$

$S_1 = 0.314$ cal/gm°C.

iv) Now $S_2 = \frac{V_2 I_2}{m(\text{slope})Q_2} \times I_2$

$= \frac{17 \times 0.68}{220 \times 2.8} \times 4.2 = \frac{11.50 \times 4.2}{550}$

$= \frac{48.55}{550}$

$S_2 = 0.08282$ cal/gm°C.

$S = \frac{S_1 + S_2}{2} = \frac{0.0914 + 0.0882}{2}$

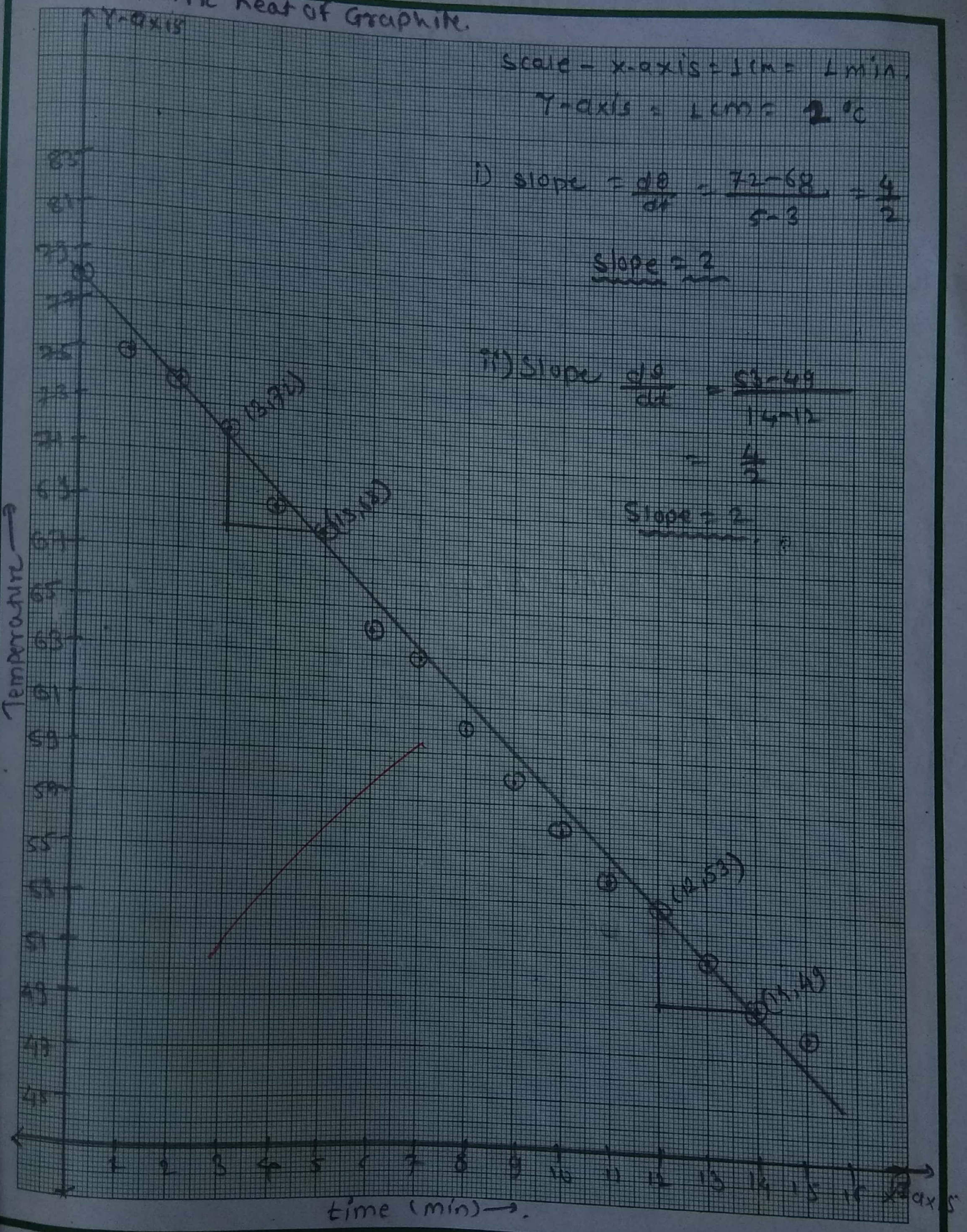
$\boxed{S = 0.0898}$

*Result :- The specific heat of graphite

$S = 0.0898$ cal/gm°C.

Name :- Nikam Harshal Madhav Std :- _____ Date :- _____

Specific heat of Graphite.



Scale - x-axis : 1 cm = 1 min.
Y-axis : 1 cm = 2 °C

i) slope = $\frac{d\theta}{dt} = \frac{72-68}{5-3} = \frac{4}{2}$

slope = 2

ii) slope $\frac{d\theta}{dt} = \frac{53-49}{13-11}$

$= \frac{4}{2}$

slope = 2

Scale: