.C & K.V.S.C. Government Degree College,

Nandyal, Kurnool District.

DEPARTMENT OF PHYSICS

GROUP DISCUSSION

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PSC & KVSC Government Degree College, Nandyal, Kurnool District

Department of Physics

Energy Conservation Day

Activity: *Group Discussion*

Title of the Activity: Renewable energy sources

Date: 14.12.2018

Brief Report: To aware the Students on Energy conservation Mr. Y. Gishnu Nag Vijay, Lecturer in Physics conducted a Group discussions among III B.Sc.(MPCs) Students. Students actively participate in the discussion and express their opinion.

Some Snap Shots of the activity



Signature of the Incharge

Signature of the Principal

Principal
PSC & KVSC Govt. College
Nandyal-518 502, Kurnool(Dt) A.P.

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Department of Physics

GROUP DISCUSSION

List of Participants

TOPIC: Renewable Energy Sources

S.No.	Name of the Student	Role
1.	M. Pavan Kumar	Leader
2.	S. Kalyan	Member
3.	A. Rajkumar	Member
4.	K. Kethari goud	Member
5.	P. Haribabu	Member

Signature of the Incharge

Signature of the Principal

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PSC & KVSC Government Degree College, Nandyal, Kurnool District

Department of Physics

Activity: *Group Discussion*

Title of the Activity: 8085 microprocessor

Date: 22.02.2019

Brief Report: To improve the Students knowledge on microprocessors Mr. Y. Gishnu Nag Vijay, Lecturer in Physics conducted a Group discussions among III B.Sc.(MPCs) Students. Students actively participate in the discussion and express their opinion.

Some Snap Shots of the activity



Signature of the Incharge

Signature of the Principal

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Department of Physics

GROUP DISCUSSION

List of Participants

TOPIC: 8085 Micro processor

S.No.	Name of the Student	Role
1.	M. Priyanka	Leader
2.	D. Chandrika	Member
3.	D. Moulalamma	Member
4.	V. Pavani	Member
5.	C. Ramatulasi	Member
6.	P. Rajiya	Member

Signature of the Incharge

Signature of the Principal

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NANDYAL



DEPARTMENT OF PHYSICS

GROUP DISCUSSION

2021 – 2022

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PSC & KVSC GOVERNMENT COLLEGE, NANDYAL

Departmental activity Report

Name of Department : Physics

Name of the Activity : Group Discussion

Dates : 10-06-2022

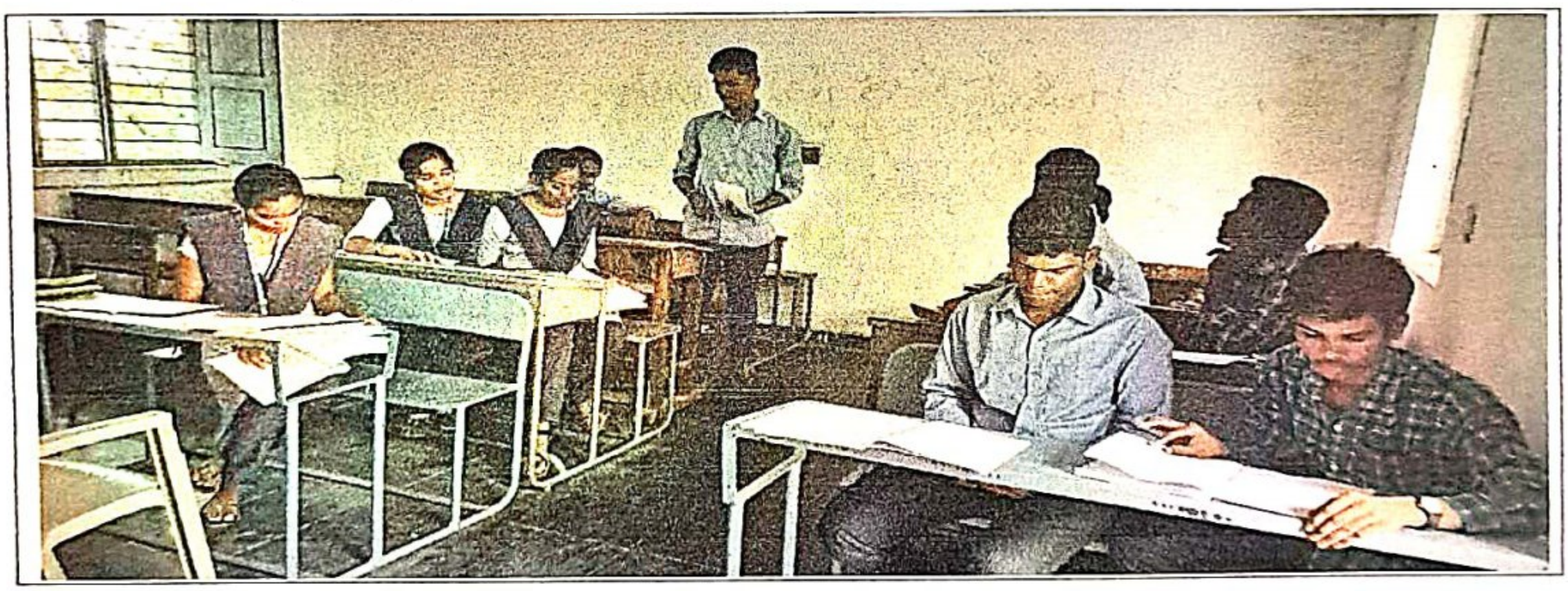
Co-ordinator of the Program : Sri Y.G.N.Vijay

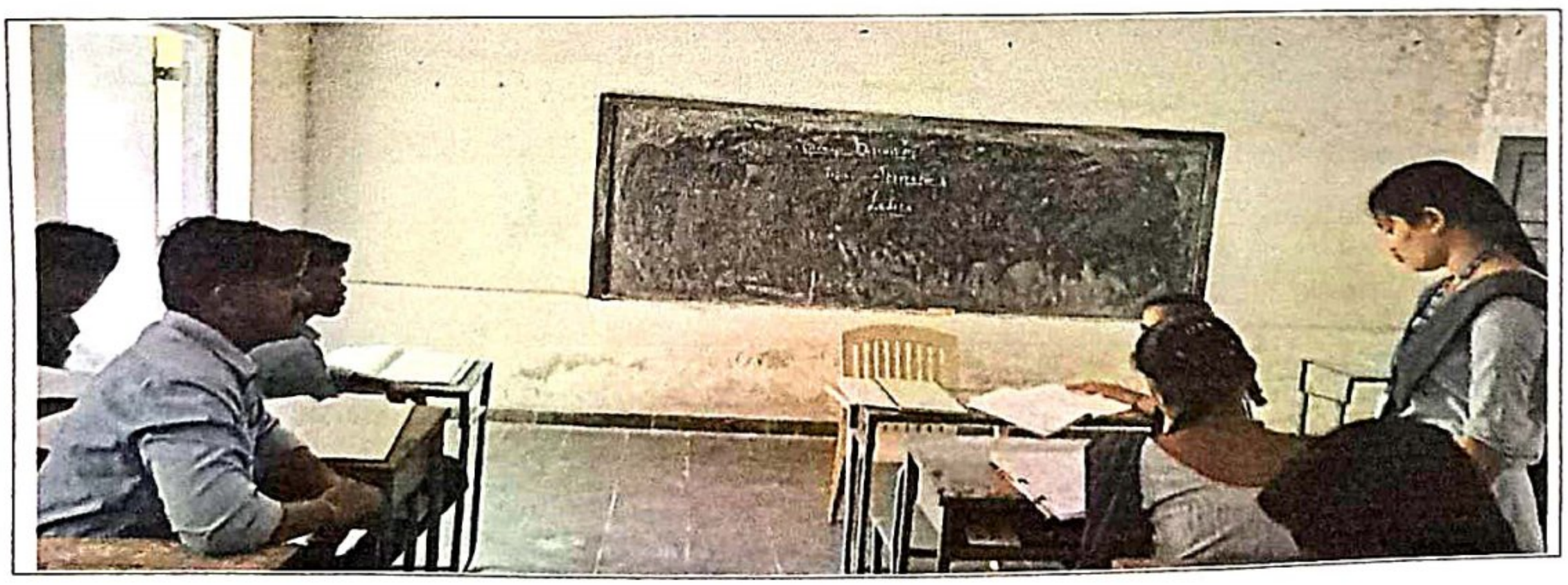
Names of Lecturers involved : Smt A.Padmavathi, R.Shashikala, Dr V.Ramesh Kumar

Number of students attended : 12

Brief report of the Activity :

I MPCs students participated in group discussion on topic Lasers and Abberations





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Group Discussion
Department of physics

Aberration :- The deviation from actual size, shape and position of an object as calculated by simple equations are called abberrations.

The defects are mainly due to
(1) Due to light (2) Due to optical system.

Due to light :- If the light is not monochromatic, then the image formed by lens is multicoloured and blurred. This defect is called chromatic aberration.

Due to optical system :- Even if the light is monochromatic, then the defects in the images are called monochromatic aberrations.

There are 5 Types :-

1. Spherical aberration 2. Coma 3. Astigmatism
4. Curvature 5. Distortion.

Important formulae :-

for a lens

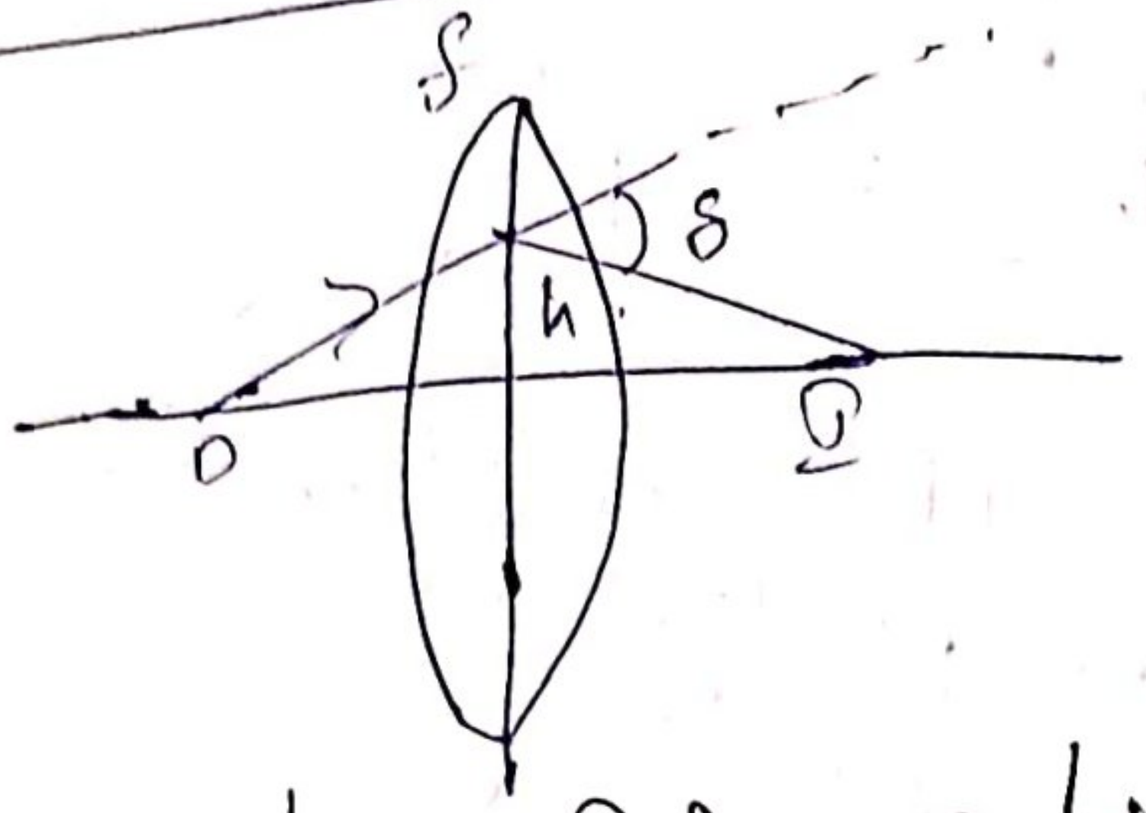
u = object distance
v = Image distance
f = focal length.

(i) $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ where.

(ii) $\frac{1}{f} = (\mu - 1)\left[\frac{1}{R_1} - \frac{1}{R_2}\right]$ where μ = refractive index

(iii) deviation produced by a lens.

$\delta = \frac{h}{f}$ where h = height at which light ray strikes the lens.



deviation

Chromatic Aberration

Definition:- The inability of a lens to form white image of white object is called chromatic aberration.

(1) This is due to the fact that refractive index depends on colour of light.

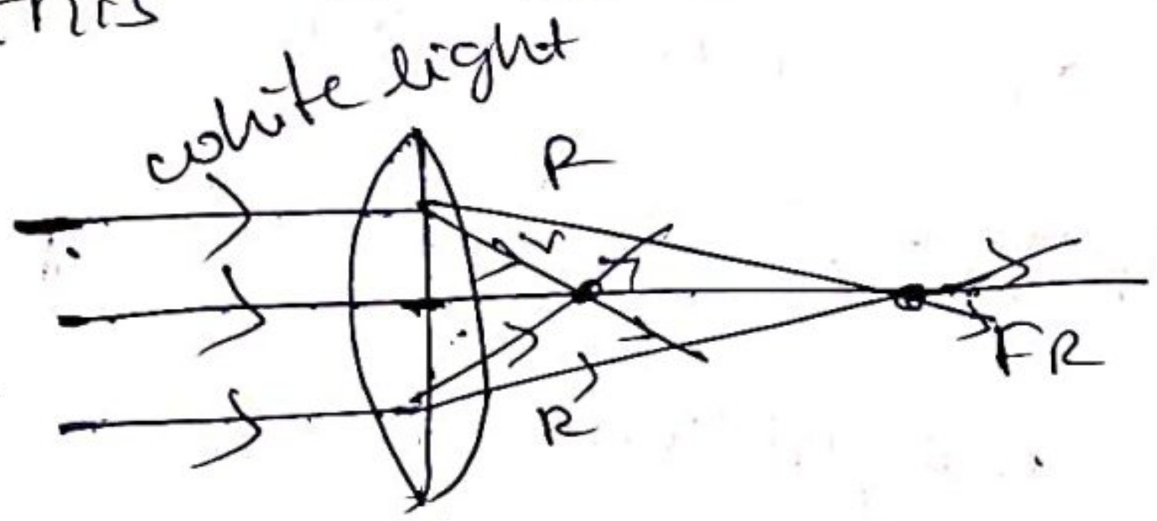
As refractive index of violet colour is greater than refractive index of red colour, hence the focal length for red colour is greater than the focal length for violet colour from the formulae $\frac{1}{f} = (\mu - 1)\left[\frac{1}{R_1} - \frac{1}{R_2}\right]$

(2) when a parallel beam of white light falls on the lens, then violet ray form image at a point F_V nearer to the lens and red rays form the image at a point F_R far from the lens.

The remaining colour forms images in between fv.

(3) If a Screen is placed at fv, the center of image is violet while the outer surface is red.

If the screen is placed at FR, the Centre of image is red while the outer is multicoloured and blurred this is called chromatic abberration.



Types of chromatic aberration:-

chromatic aberration is 2 types.

1. Longitudinal chromatic aberration
2. Lateral chromatic abberation.

Longitudinal chromatic aberration:-

1) The formation of images of different colours at different positions on axis of the lens is called Longitudinal chromatic aberration.

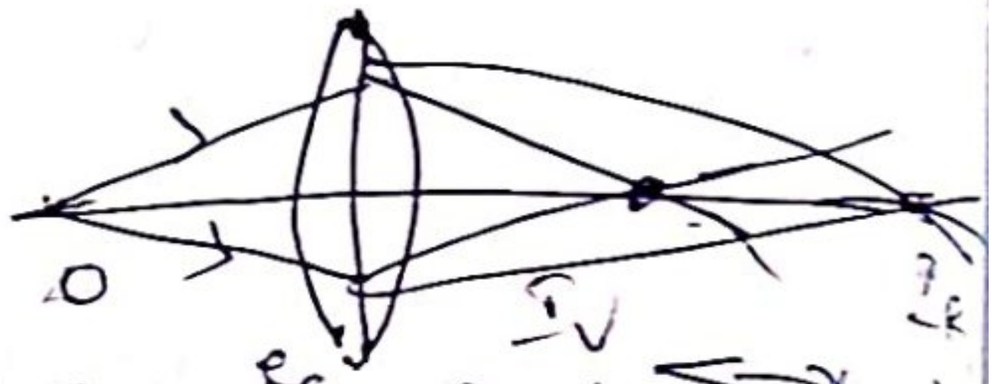
2) Longitudinal chromatic aberration

$= I_R - I_V$

3) when object is at infinity then longitudinal chromatic aberration = Fo

2. Lateral chromatic aberration:-

1) the formation of images of different colours of different sizes, is called lateral chromatic aberration.



2) Image of object AB is formed by red rays $A_R B_R$ and voilet rays $A_V B_V$.

3) Lateral chromatic aberration

$$y = A_R B_R - A_V B_V$$

4) Reason :- magnification depends on colour,

$$\therefore n = \frac{\text{Size of image}}{\text{Size of object}} = \frac{\text{distance of image}}{\text{distance of object}}$$

Laser principle

→ for laser action, the 3 steps are

1. pumping
2. population inversion
3. stimulated emission.

1. pumping:- let E_1, E_2, E_3 are the energy levels of an atom.

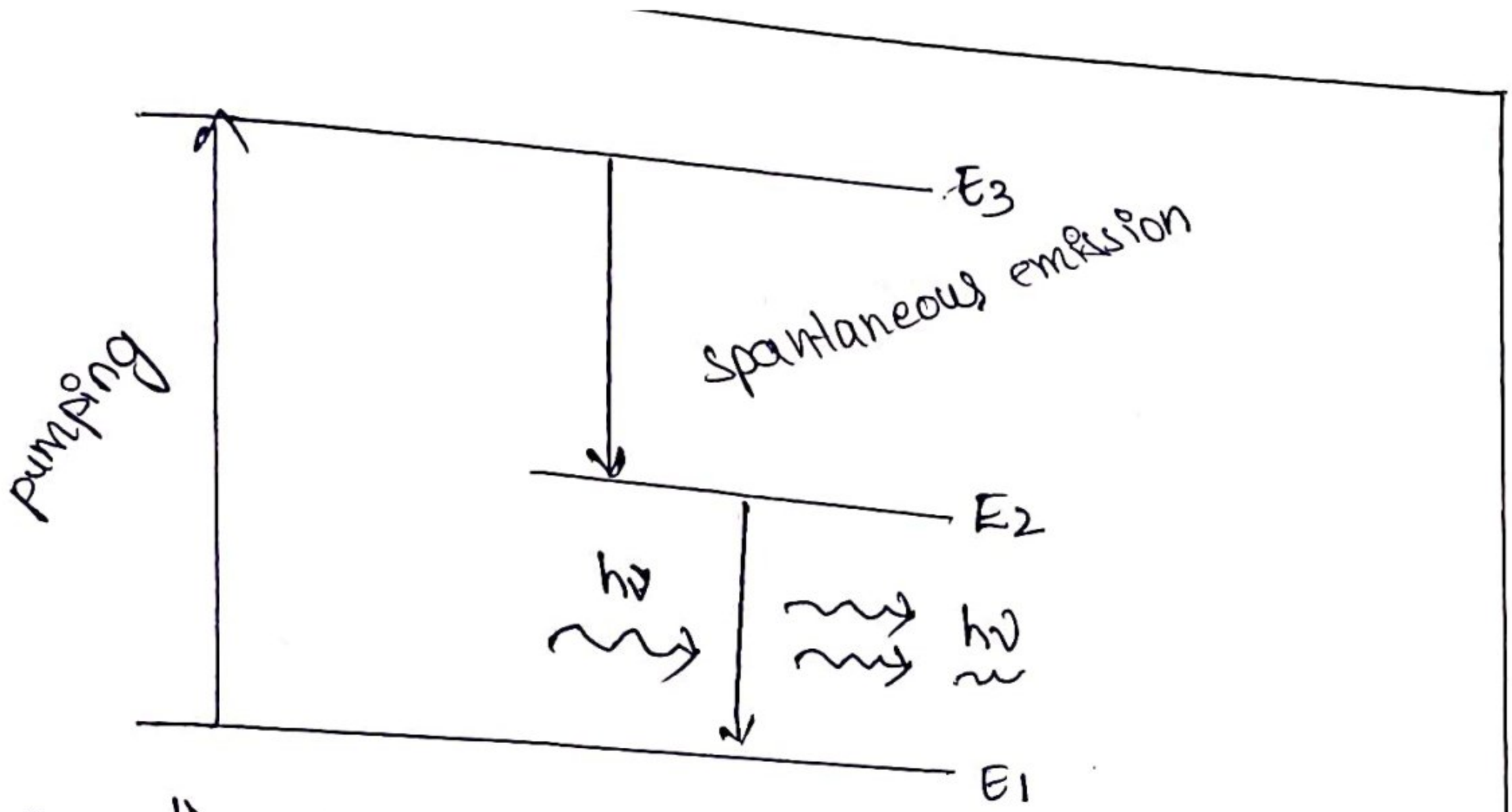
E_1 = ground state. E_2 = Metastable state

and E_3 = Excited state.

By supplying energy from external source the atoms in ground state are pumped to excited state Eg. by stimulated absorption.

2. population inversion:-

the lifetime of excited state is about 10^{-8} sec. with in this time internal. atoms in excited state come to meta stable state by spantaneous emission. The life time is about 10^{3} sec.



so, the atoms stay longer time in this state E_2 hence no. of atoms increases thus a population of state E_2 becomes greater than the population of state E_1 In this way population.

Inversion is achieved between the states. E_1 and E_2

Stimulated Emmision:

Now a photon of energy $(h\nu = E_2 - E_1)$ is emited during spontaneous emission.

This photon stimulated the emision from E_2 to E_1 state. thus light of high intense, highly coherent, laser light is produced.

Group Discussion

Department of physics

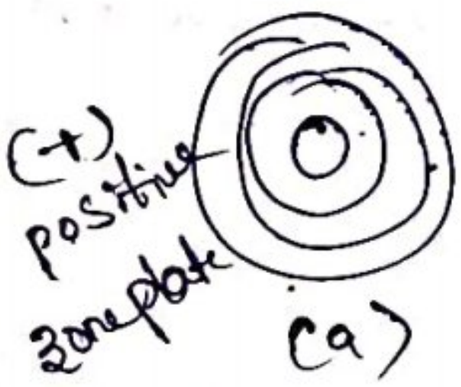
Explain construction and working of Zoneplate?

Construction :-

1) on a large sheet of white paper, Concentric Circles are drawn whose radii proportional to Square root of natural numbers.
2) Alternates Circles are Coated with black point.
3) This is photographed on a glass plate. This negative Glass plate is called Zone plate.

Working :-

4) Zones black end appears transparent in negative.
5) These as 2 types of Zone plates.



(a)



(b)

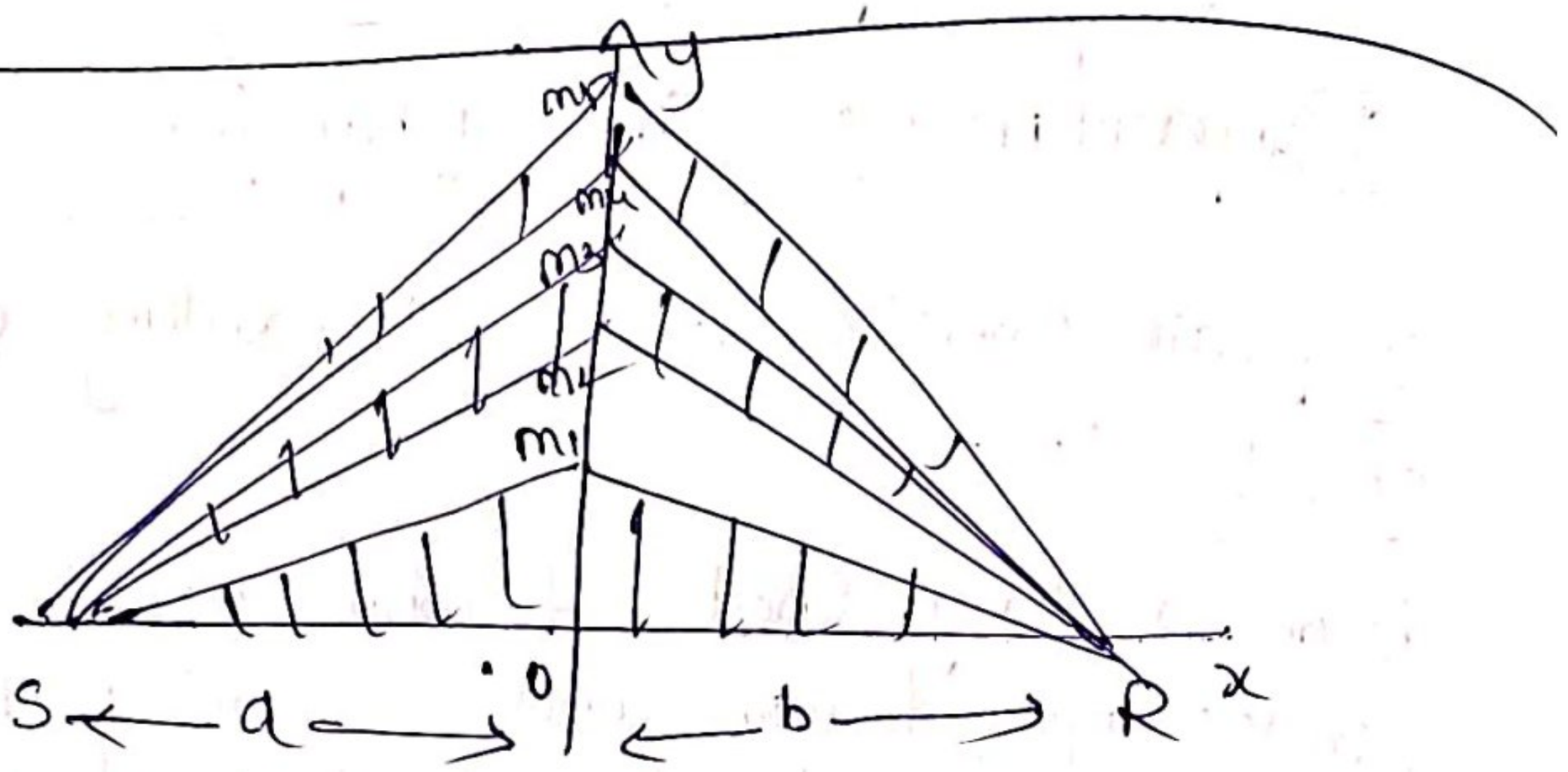
(-) negative Zone plate

6) In positive Zone plate, odd Zones are transparent even, Zones are opaque.

In Negative Zone plate, even Zones are transparent odd Zones are opaque.

(7) Let 'xy' be cross section of a Zone plate.

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(8) $OM_1, OM_2, OM_3, \ldots OM_n$ are radii of Zones. Let $SO = a$ and $OP = b$.

There is a path difference of $\lambda/2$ bet waves from two Zones.

(9) from diagram,

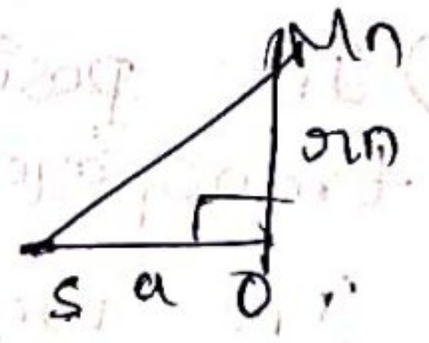
$SO + OP = a + b$.

$SM_1 + M_1P = a + b + \lambda/2$

$SM_2 + M_2P = a + b + 2\lambda/2$ —— and so on ——

$\ldots SM_n + M_nP = a + b + n\lambda/2 \longrightarrow (1)$

10) from diagram,



$SM_n^2 = SO^2 + OM_n^2$

$SM_n^2 = a^2 + r_n^2$

$SM_n = \sqrt{a^2 + r_n^2}$

$SM_n = (a^2 + r_n^2)^{1/2}$

$= a\left(1 + \frac{r_n^2}{a^2}\right)^{1/2}$

$a\left(1 + \frac{r_n^2}{2a^2}\right) = a + a\frac{r_n^2}{2a^2}$

$SM_n = a + \frac{r_n^2}{2a} \longrightarrow (2)$

11) Similarly from diagram.

$Mnp^2 = op^2 + omn^2$

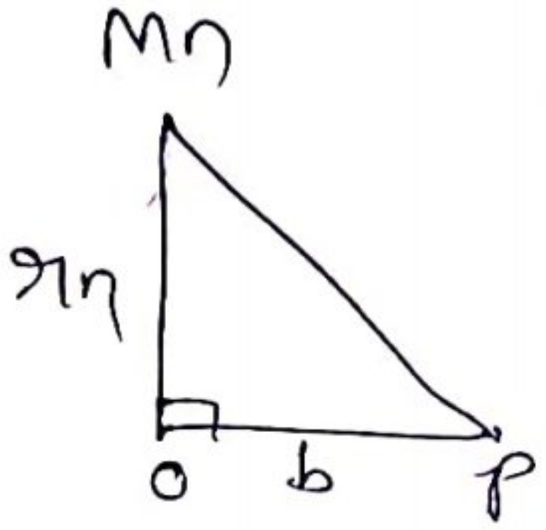
$Mnp^2 = b^2 + xn^2$

$Mnp = \sqrt{b^2 + xn^2}$

$= b\left(1 + \frac{xn^2}{b^2}\right)^{1/2}$

$= b\left(1 + \frac{xn^2}{2b^2}\right)$

$b + \frac{xn^2}{2b^2}$



$Mnp = b + \frac{xn^2}{2b} \longrightarrow (3)$

12) Substituting eqn (2) and (3) in eqn (1) we have

$\alpha + \frac{xn^2}{2a} + \beta + \frac{xn^2}{2b} = \alpha + \beta + n\lambda/2$

$\frac{xn^2}{2}\left[\frac{1}{a} + \frac{1}{b}\right] = n\lambda/2$

$xn^2\left[\frac{1}{a} + \frac{1}{b}\right] = n\lambda$

$\frac{1}{a} + \frac{1}{b} = \frac{n\lambda}{xn^2} \Rightarrow \frac{1}{a} + \frac{1}{b} = \frac{1}{f}$

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Group Discussion

Department of Physics

Newton Rings, theory and experiment

*when a plano Convexlens of large radius of curvature is placed on a plane glass plate, then a thin airfilm is formed in between them.

*when monochromatic light falls on this airfilm, due to interference, a series of bright and dark concentric rings are formed around 'O'. these are called Newton rings.



Experiment :-

1) Light from monochromatic Source S is made parallel by a Convexlens.

2) This parallel beam of light falls on a glass plate G inclined at angle of 45° with horizontal.

3) The reflected light from G falls on airfilm

4) Due to the interference of light from air film, Newton rings are formed. These are observed with microscope M.

5) The path difference between these two rays. $\Delta = 2\mu t \cos r \pm \lambda/2$.

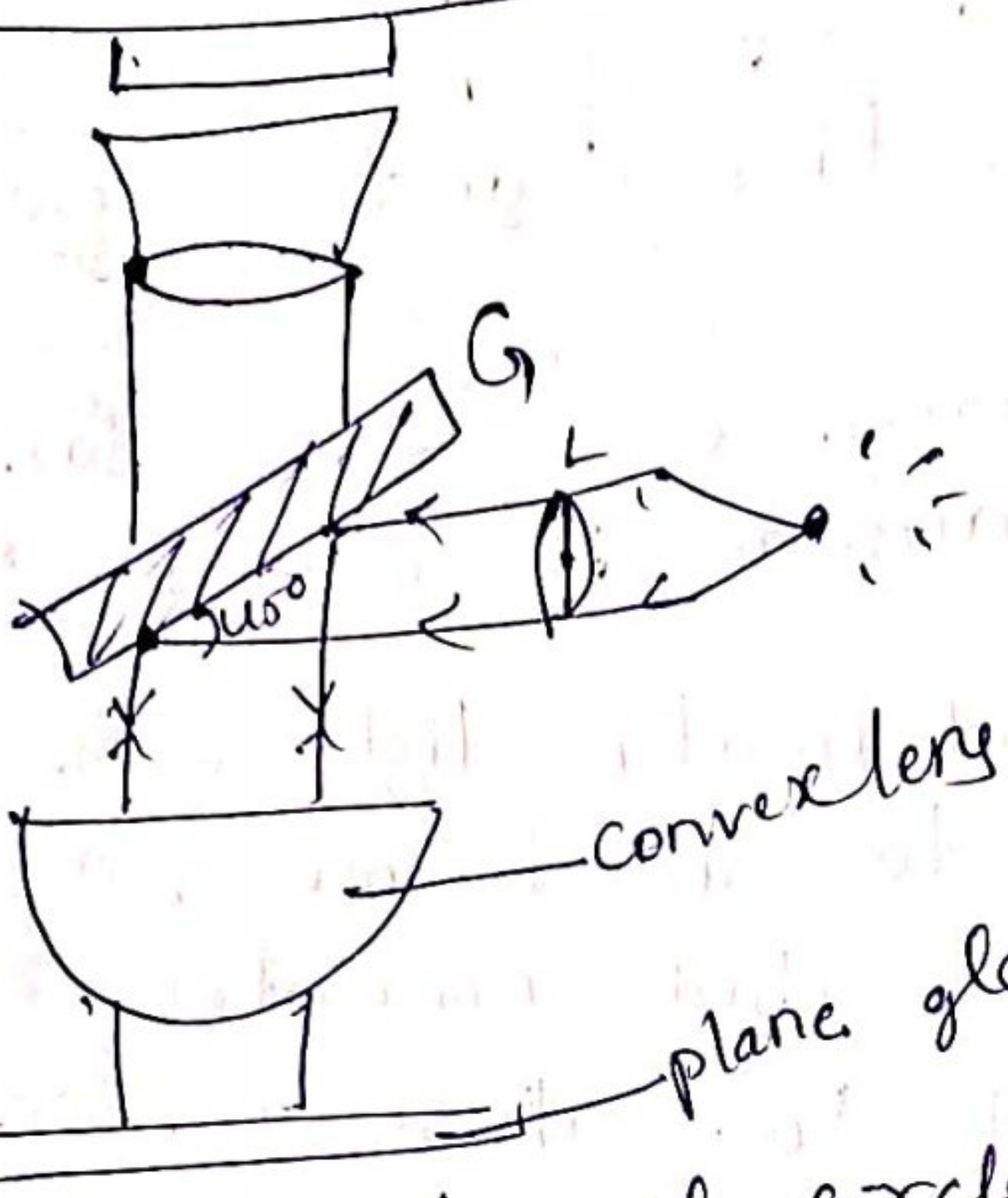
6) for Bright fringes :- $2\mu t \cos r \pm \lambda/2 = n\lambda$.

$\Rightarrow 2\mu t \cos r = (2n+1)\lambda/2$ where $n = 0, 1, 2, 3, \ldots$

But, for air film, $\mu = 1$ & for normal incidence $r \approx 0$

$2 \cdot 1 \cdot t \cos 0° = (2n+1)\lambda/2 \Rightarrow \boxed{2t = (2n+1)\lambda/2} \rightarrow (1)$

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7) from properties of circles

$NP \times NQ = NO \times NP$

$\therefore r \times r = t(2R - t)$

$r^2 = 2Rt - t^2$ $\quad$ $\because t^2$ is neglect

$r^2 = 2Rt$

$t = \frac{r^2}{2R} \longrightarrow (2)$

8) from eqn (1) $2 \times \frac{r^2}{2R} = (2n+1)\frac{\lambda}{2}$

$\frac{r^2}{R} = (2n+1)\frac{\lambda}{2}$

9) [But Diameter of ring $D = 2r \Rightarrow r = D/2$]

$\frac{D^2}{4} = (2n+1)\frac{\lambda R}{2}$

$D^2 = (2n+1)2\lambda R$

$D \propto \sqrt{(2n+1)}\ \sqrt{2\lambda R} \longrightarrow (3)$ (where $n = 0, 1, 2, 3 \ldots$)

* Diameter of Bright ring is proportional to $\sqrt{2n+1}$

10) for Dark rings :-

path difference $2t = n\lambda$

from eq ② $\frac{2rr^2}{2R} = n\lambda$

$r^2 = n\lambda R$

11) [But $D = 2r \Rightarrow r = D/2$]

$\frac{D^2}{4} = n\lambda R$

$D^2 = 4n\lambda R$

$D \propto \sqrt{n} \cdot \sqrt{4\lambda R} \rightarrow$ ④ [where $n = 0, 1, 2, 3, \ldots$]

* from this Diameter of Dark rings is proportional to $\sqrt{n}$.

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PSC & KVSC GOVERNMENT COLLEGE, NANDYAL

Department of Physics

Students Attendance

Name of the Activity: Group Discussion for IIMPCS

Date of the activity : 10-06-2022

S.No	Name of the student	Signature of the student
1	B. Kavya	B. Kavya
2	V. Uma	V. Uma
3.	N. Pranay kumar	N. Pranay kumar
4.	G. Lavanya	G. Lavanya
5.	P. Surendhra	P. Surendhra
6.	P. Siva Narendra	P. Siva Narendra
7	M. Ushendraiaiah	M. Umaiah
8.	D. Raheem	D. Raheem
9.	K. Sunil	K. Sunil
10.	C. chini krishna	C. chini krishna
11.	P. Narasimha	P. Narasimha
12.	shAashad	hAashad

(1) Y. Krishna Dey

(2) A. Padmaraju.

(3)

(4)

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NANDYAL



DEPARTMENT OF PHYSICS

GROUP DISCUSSION

2022 – 2023

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PSC & KVSC GOVERNMENT COLLEGE, NANDYAL
Departmental activity Report

Name of Department : Physics

Name of the Activity : Group Discussion

Dates : 29-12-2022

Co-ordinator of the Program : Sri Y.G.N.Vijay

Names of Lecturers involved : Smt A.Padmavathi , R.Shashikala, Dr V.Ramesh Kumar

Number of students attended : 15

Brief report of the Activity :

III MPCs students participating in group discussion on the topic freezing mixtures produced by adding salts to Ice



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—: Freezing Mixtures :—

A freezing Mixture is a mix of salt & ice. it is used to lower the temperature.

freezing Mixture is a Composite of wo or more elements. it is used to btain a temperature below the freezing int of a Solvent. the principle hind it is the depression in freezing int.

Temperature lower than 0°c can be roduced by mixing certain Salt with lt. when Salt is mixed with ice it ives Some heat to the ice Caying a little of ice to melt.

this process Cannot go indefinetly. the lowest temperature that can e obtained by this method is fixed depending upon the Salt & is called the eutectic temperature. when this temperature is reached Salt will Not absorbed into the lution & hence there is no ater fall of temperature.

Joule kelvin experiment is shown in figure

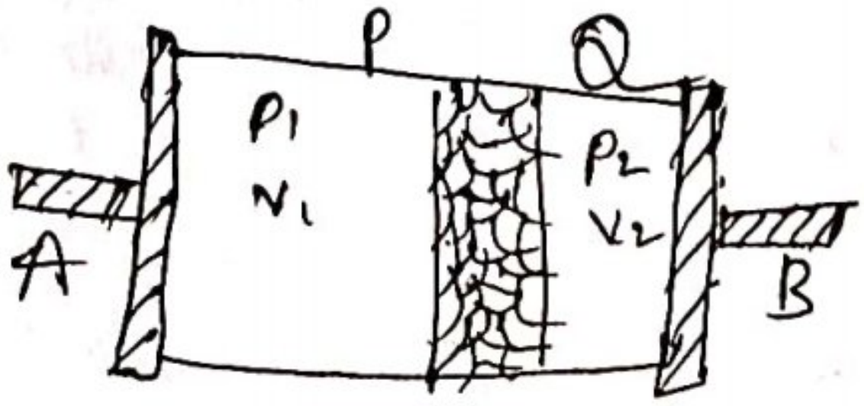
* PQ is the thermally insulated halloco cylinder the porous plug Q divides the cyclinder into two parts

* A & B are two non conducting pistons on both sides

* the gas in left compartment is at higher constant pressure P1 and in right compartment the goes has lower constant pressure P2

* when the gas in left compartement at higher pressure P1 is compressed then the goes passed through the porous plug & goes into right compartment of lower constant pressure P2 then the distance b/w molecus increse & the gas suffer change in temperature

when a gas is passed of through a porous plug from a high constant pressure region to a low constant pressure region the gas suffers a change in temperature this is called Joule kelvin effect or Joule thomson effect



* All the gases suffer a change in temperature
* At room temperature Hydrogen & Helium show heating effect all other gases show cooling effect
* The change in temperature is directly proportional to the change in pressure

i.e $dT \propto (P_1 - P_2)$

$$\frac{dT}{(P_1 - P_2)} = \text{constant}$$

* The fall of temperature per unit Pressure difference decreases as intial of temperature increases

i.e $\frac{dT}{(P_1 - P_2)}$ decreses as intial temperature increases

The temperature of which the gas shows no Joule-kelvin effect is called the inversion t for different gases

let $P_1V_1T_1$ & $P_2V_2T_2$ be the pressure volume and tempreture of the gas on left and right Compre ssure respecting let unit mass of gas passed through the before & after passing throug the porous plug

work done on the gas by the gas piston

$A = P_1V_1$ work done by the gas on the piston

$B = P_2V_2$ Net work done by the gas

$= (P_1V_1 - P_2V_2)$ The system is thermally isolated so the work is done utilizing is internal energy

i.e work done = Decrease in internal energy $(P_2V_2 - P_1V_1) = (U_1 - U_2)$

$P_2V_2 + U_2 = P_1V_1 + U_1$ (or) $PV + U = \text{constant}$ This is enthlpy

So Joule kelvin effect follows the law of conservation of

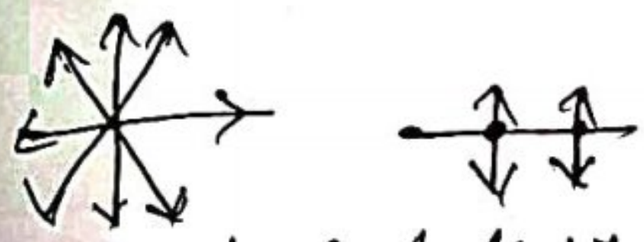
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polarization proves transverse nature of light

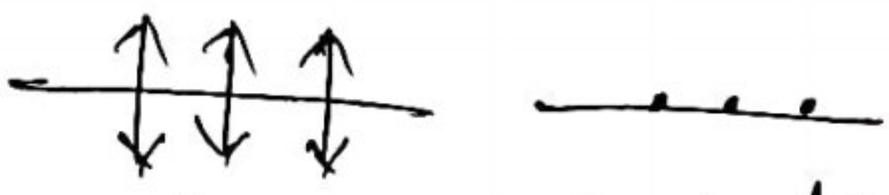
*. the light which has vibrations in all planes is called unpolarised light.

*. the light which has electric field vector vibrations confirmed in a single plane, then it is called plane polarized light.

*. If the direction of vibration is ⊥er to the plane of paper, then they are called (or) complex they are represented by dots.



unpolarised light

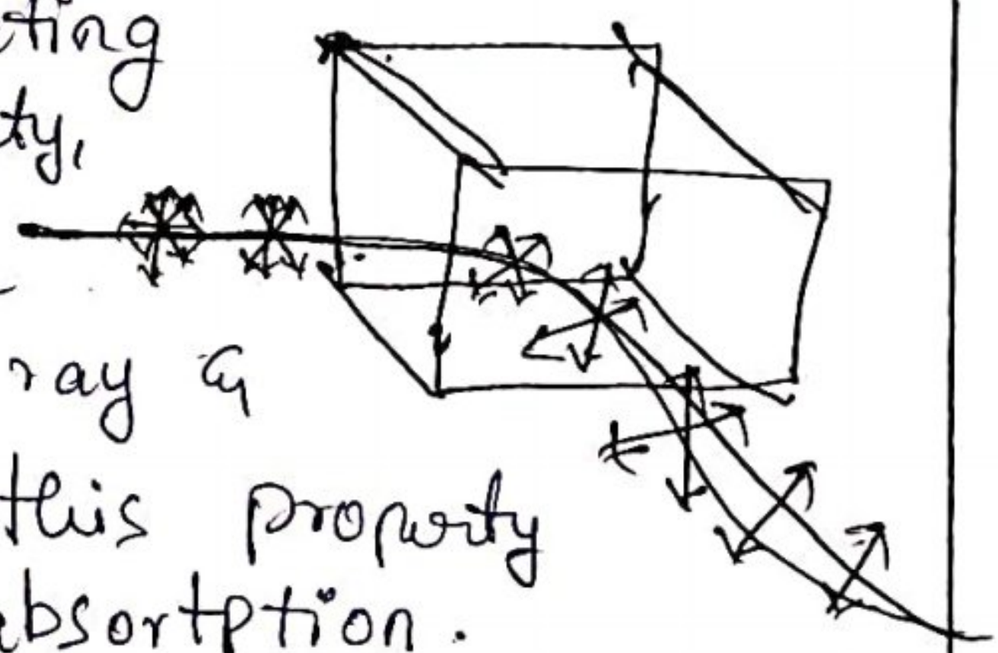


plane polarized light

polarization by Selective absorption:-

*

Some of doubly refracting crystals have the property, that they absorb one of the E-ray (or) O-ray & transmitt the other. this property is called selective absorption.



*. the crystals showing this property are called dichroic crystals.

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The Expression for diffource of two Specific heats of a gas for a perfect gas:-

ecific heat at Constant Volume(C_v):- It is amount of heat required to raise temp of 1 mole of gas by 1°C (or) 1K Constant Volume.

$$C_v = \left(\frac{\partial Q}{\partial T}\right)_v$$

ecific heat at Constant pressure (C_p):- It is amount of heat required to raise temp of 1 mole of gas 1°C (or) 1K at ytant pressure.

$$C_p = \left(\frac{\partial Q}{\partial T}\right)_p$$

he difference of two Specific heats

$$C_p - C_v = \left(\frac{\partial Q}{\partial T}\right)_p - \left(\frac{\partial Q}{\partial T}\right)_v$$

$$= \left(\frac{T \cdot \partial S}{\partial T}\right)_p - \left(\frac{T\,\partial S}{\partial T}\right)_v$$

$$= T \cdot \left(\frac{\partial S}{\partial T}\right)_p - T\left(\frac{\partial S}{\partial T}\right)_v$$

$$C_p - C_v = T\left[\left(\frac{\partial S}{\partial T}\right)_p - \left(\frac{\partial S}{\partial T}\right)_v\right] \rightarrow (1)$$

let entropy(S) is a function of variable v & T

$$S = f(v, T)$$

$$\text{then } dS = \left(\frac{\partial S}{\partial T}\right)_v \cdot dT + \left(\frac{\partial S}{\partial v}\right)_T dv$$

Differentiating w.r.t T

$$\left(\frac{\partial S}{\partial T}\right)_p = \left(\frac{\partial S}{\partial T}\right)_v + \left(\frac{\partial S}{\partial v}\right)_T \cdot \left(\frac{\partial v}{\partial T}\right)_p$$

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$$= \left(\frac{\partial P}{\partial T}\right)_V \cdot \left(\frac{\partial V}{\partial T}\right)_P \rightarrow (2)$$

[$\because$ from maxwell's 2nd eq $\left(\frac{\partial S}{\partial V}\right)_T = \left(\frac{\partial P}{\partial T}\right)_V$]

Sub eq (2) in eq (1)

$$C_p - C_v = T \left(\frac{\partial P}{\partial T}\right)_V \cdot \left(\frac{\partial V}{\partial T}\right)_P \rightarrow (3)$$

For a perfect gas:-

for 1 mole of perfect gas, $PV = RT \Rightarrow P = \frac{RT}{V}$

Differentiating $\Rightarrow \left(\frac{\partial P}{\partial T}\right)_V = \left(\frac{R}{V}\right)$

from $PV = RT$

$V = \frac{RT}{P}$ Differentiating $\left(\frac{\partial V}{\partial T}\right)_P = \frac{R}{P}$ $\rightarrow (4)$

Substitute values in eq (4) in eq (3)

$$C_p - C_v = T \cdot \frac{R}{V} \cdot \frac{R}{P}$$

[$\because PV = RT$]

$$C_p - C_v = T \frac{R^2}{PV}$$

$$C_p - C_v = \cancel{T} \cdot \frac{R^2}{\cancel{RT}} = R$$

$$C_p - C_v = R \;//$$

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PSC & KVSC GOVERNMENT COLLEGE, NANDYAL
Department of Physics
Students Attendance

Name of the Activity: Group Discussion for IIIMPCS
Date of the activity : 29-12-2022

S.No	Name of the student	Signature of the student
1.	K. Ramesh	K. Ramesh
2.	P. obulesh	P. obulesh.
3.	Y. Ishwarya	Y. Ishwarya
4.	Sk Sabiya	Sk. Sabiya
5.	G. Vanitha	G. Vanitha
6.	T. Sravani	T. Sravani
7.	B. Ashok	B. Ashok
8.	M. chandrakanth	M. chandrakanth.
9.	G. Maddamma	G. Maddamma
10.	P. pavanakeerthi	P. Pavan keerthi
11.	M. Ramakrishna	M. Rama krishna
12	A. Abdulkelam	Abdulkelam
13	Bhaveveden	Bhaveveden
14	Kg. Dhanunjay	G Dhanunjay
15	K. Sunil Gavaskar	K Sunil

(1) Y. Krishna
(2) A. Padmavathi
(3) [signature]
(4) [signature]

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