# Department of Physics
# ANNUAL REPORT 16-17

**KSN Government Degree College for Women, Anantapuram**
**DEPARTMENT OF PHYSICS**

## ACTION PLAN 16-17

| S.NO | NAME OF THE EVENT | TENTATIVE DATES |
|---|---|---|
| 1 | **Bridge Course** to I YEAR Students | June '16 |
| 2 | **Guest Lecture** on Swatch Andhra Pradesh to all the B.Sc., students | August '16 |
| 3 | **Field Trip** to District Science Museum to I YEAR Students | September '16 |
| 4 | **Guest Lecture** to II year Students | October '16 |
| 5 | **Field Trip to** III Year Students | October '16 |
| 6 | **Quiz program** in Physics – II year Students | November '16 |
| 7 | **Student Seminar** - Each paper atleast 2 students | November '16 |
| 8 | **Student study Projects** – III MPCs Students | December '16 |
| 9 | **Remedial Coaching for** Slow Learners | December'16 |
| 10 | **PG Entrance Exam Coaching** - III MPCs Students | Jan '17 |
| 11 | **National Science Day Celebration** | Feb '17 |
| 12 | **Down loaded VIDEOS of the Syllabus related topics** | Atleast 2 videos for Each paper |

*Signature of the lecturer In Charg*

# Department of Physics
# ANNUAL REPORT 16-17

| DATE: 19-08-2016 Guest Lecturer | S. Pavani, Lecturer in Physics |
|---|---|

K.S.N. Government Degree College (W), Ananthapuramu

**Attendance Certificate**

This is to certify that Dr. N.B. Shama Bharathi, Lecturer in English, SVGM GDC, Kalyandurg has attended the 'Swatch Andhra Pradesh–Krishna Pushkaralu' programme and delivered lecture on Swatch Andhra Pradesh for Final Year Students in the College.

Principal
K.S.N. Government Degree College(W)
Ananthapuramu

KSN Govt. UG College (Women)
ANANTAPUR.

# Department of Physics
# ANNUAL REPORT 16-17

| DATE:17-09-2016 | Field Trip | Department Of Physics |
|---|---|---|

~~From~~ To

The Principal,
KSN Govt. Degree College for Women,
Anantapuramu.

Madam,

A Field Trip is planned by the Department of Physics which is a part of the curriculum. The Trip is to " **District Science Museum**" at JNTU road, Ananthapuramu on 17-09-2016 from 10.00am to 01.00pm.

Hence I request you to permit the B.Sc (MPCs & MECs) students for the Field visit.

Thanking you Madam.

Yours faithfully,

[s. pavani]

PRINCIPAL
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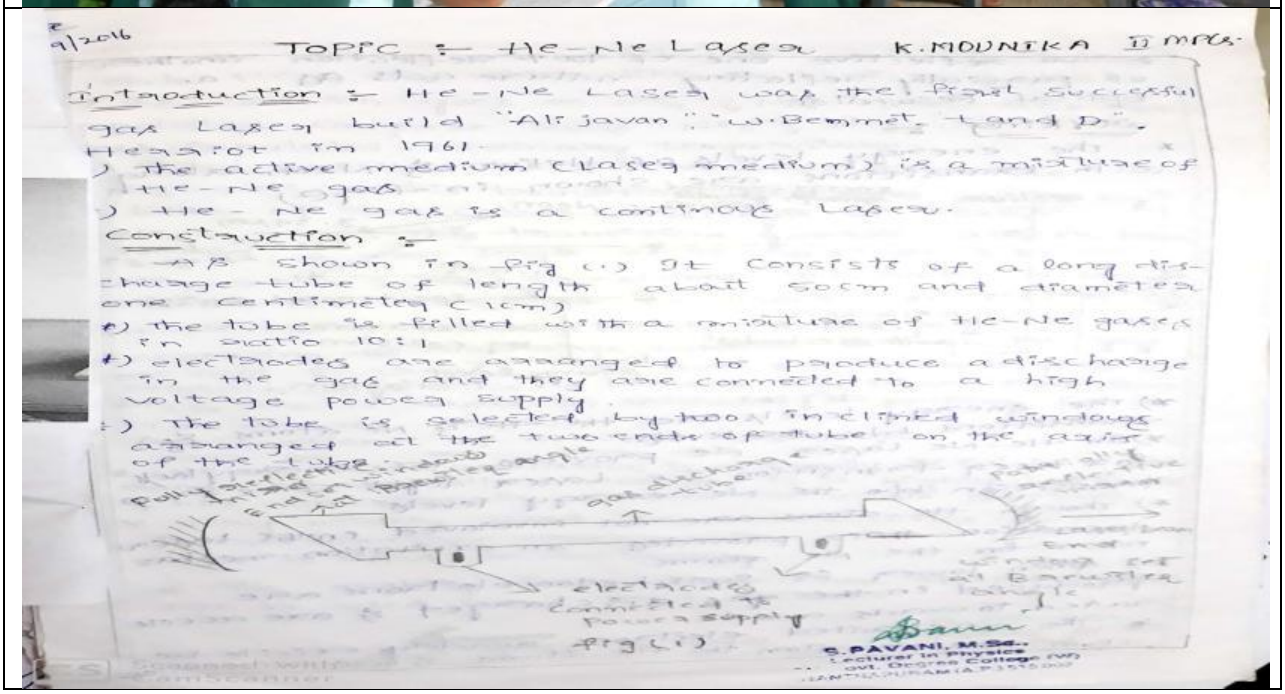
ANANTAPUR.

# Department of Physics
# ANNUAL REPORT 16-17

| | | |
|---|---|---|
| 19-09-16<br>K.Mounika | Student Seminars<br>K.Mounika (IIMPCs | S. Pavani, Lecturer in Physics |

# Department of Physics
# ANNUAL REPORT 16-17

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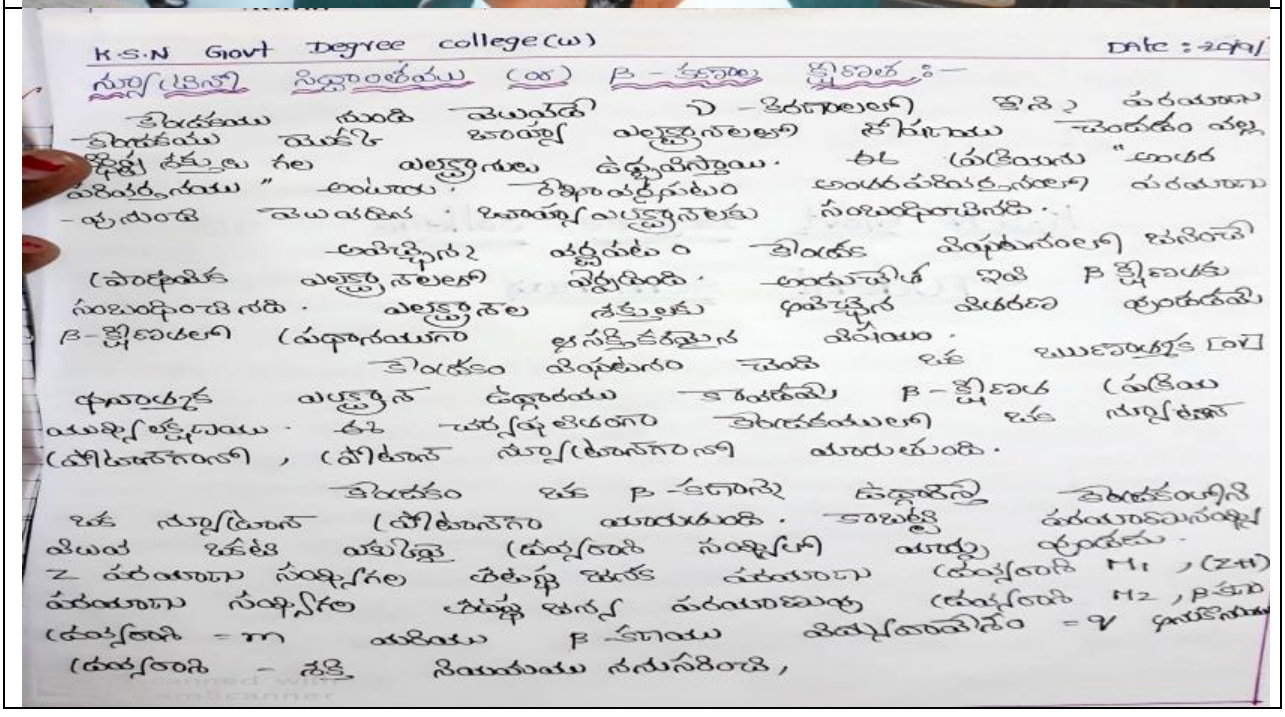
|---|---|---|
| 20-09-16<br>Neutrino Hypothesis | Student Seminars<br>Umamaheshwari(IIIMPC) | T. Syamala – Guest Faculty in Physics |

# Department of Physics
# ANNUAL REPORT 16-17

| 20-09-16<br>Gauss Law | Student Seminars<br>K.Anitha(IIIMPC) | T. Syamala – Guest Faculty in Physics |
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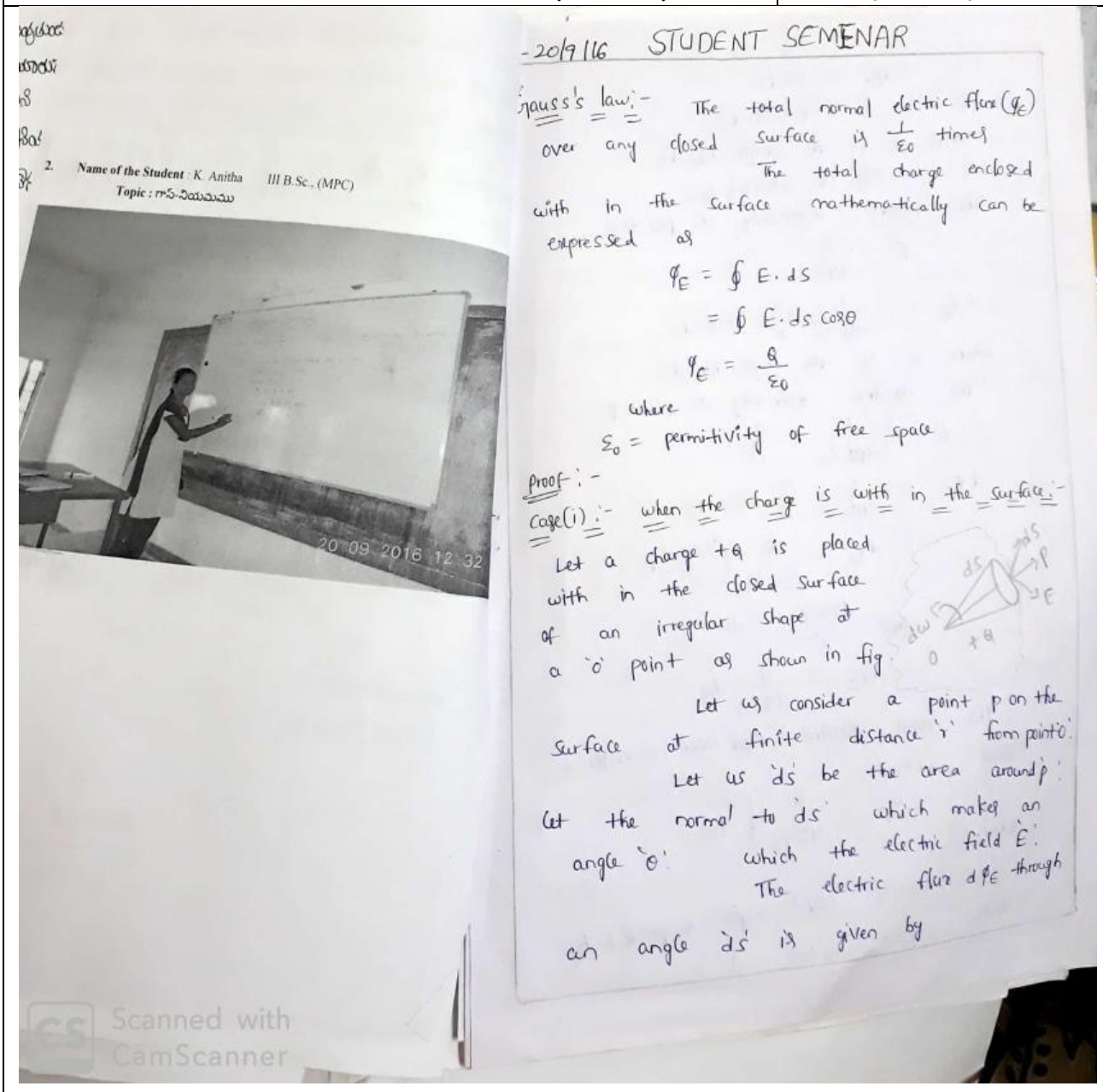

# Department of Physics
# ANNUAL REPORT 16-17

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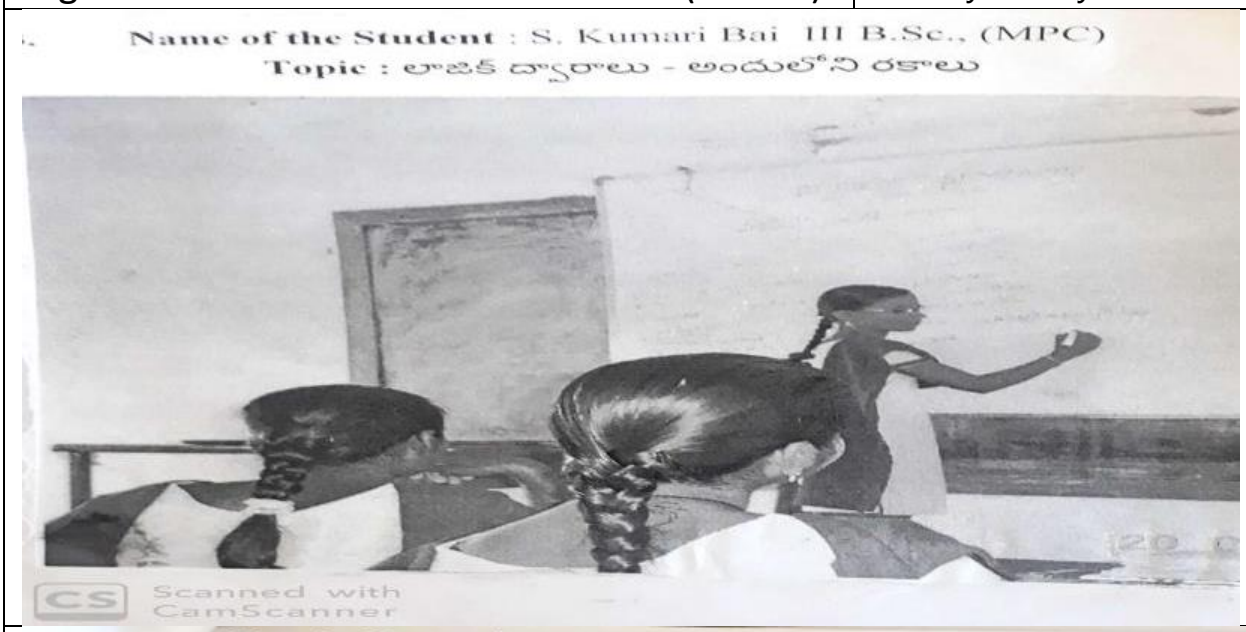
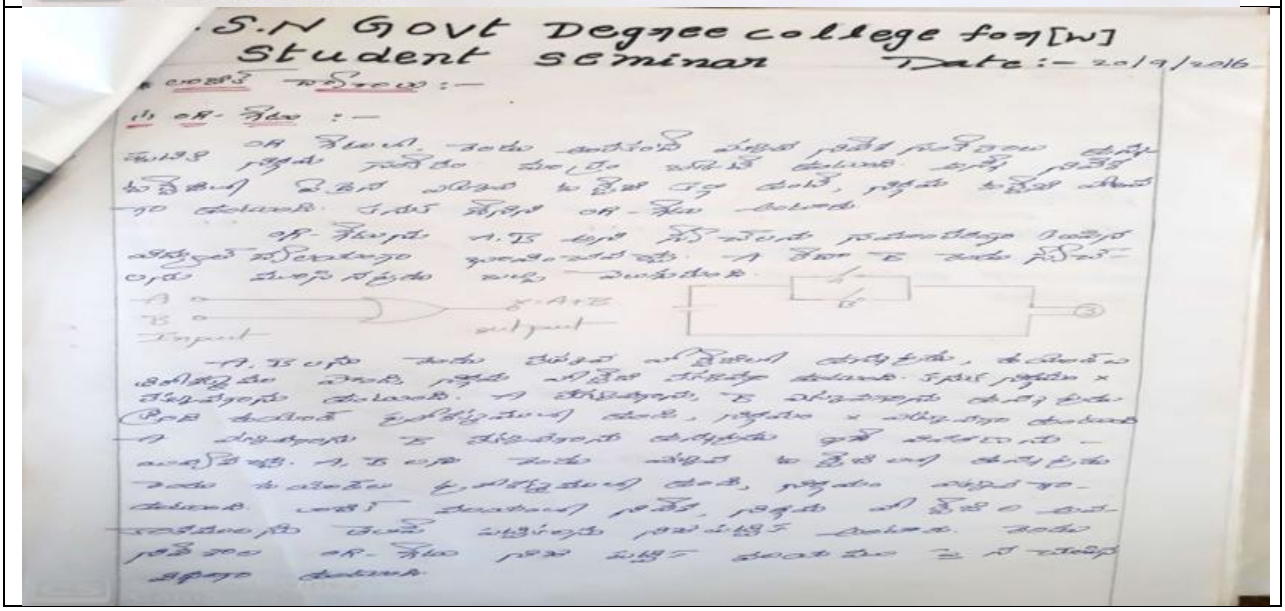
|---|---|---|
| 20-09-16<br>Logic Gates | Student Seminars<br>S.Kumari Bai(IIIMPC) | T. Syamala – Guest Faculty in Physics |



# Department of Physics
# ANNUAL REPORT 16-17

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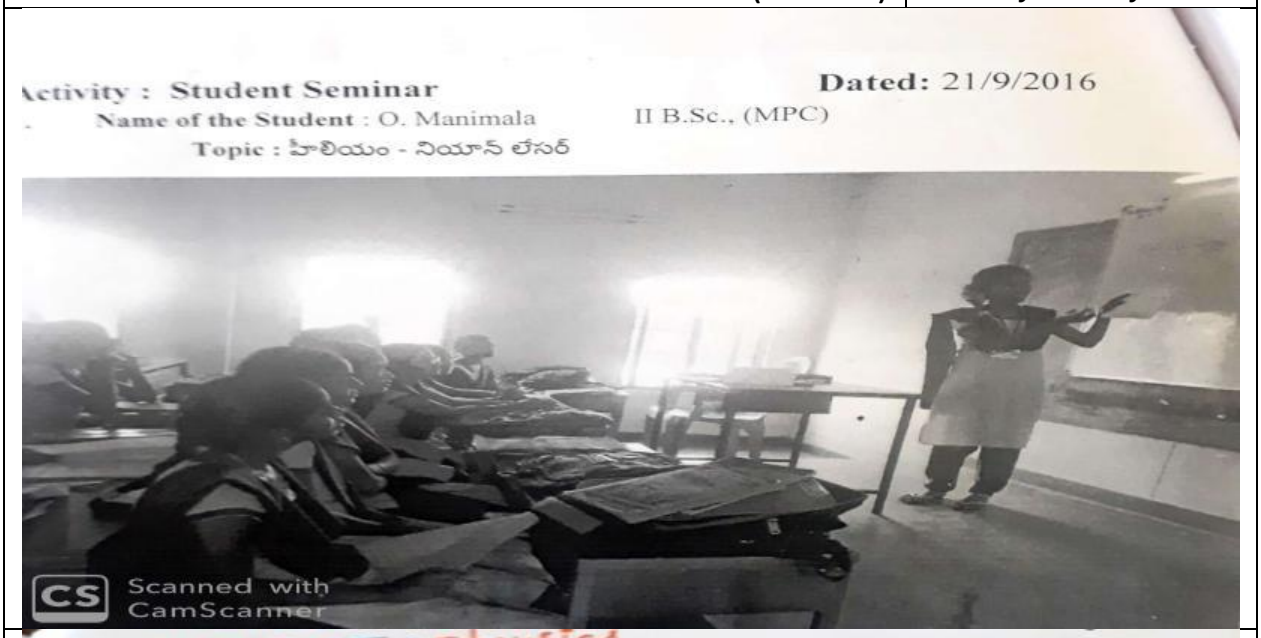
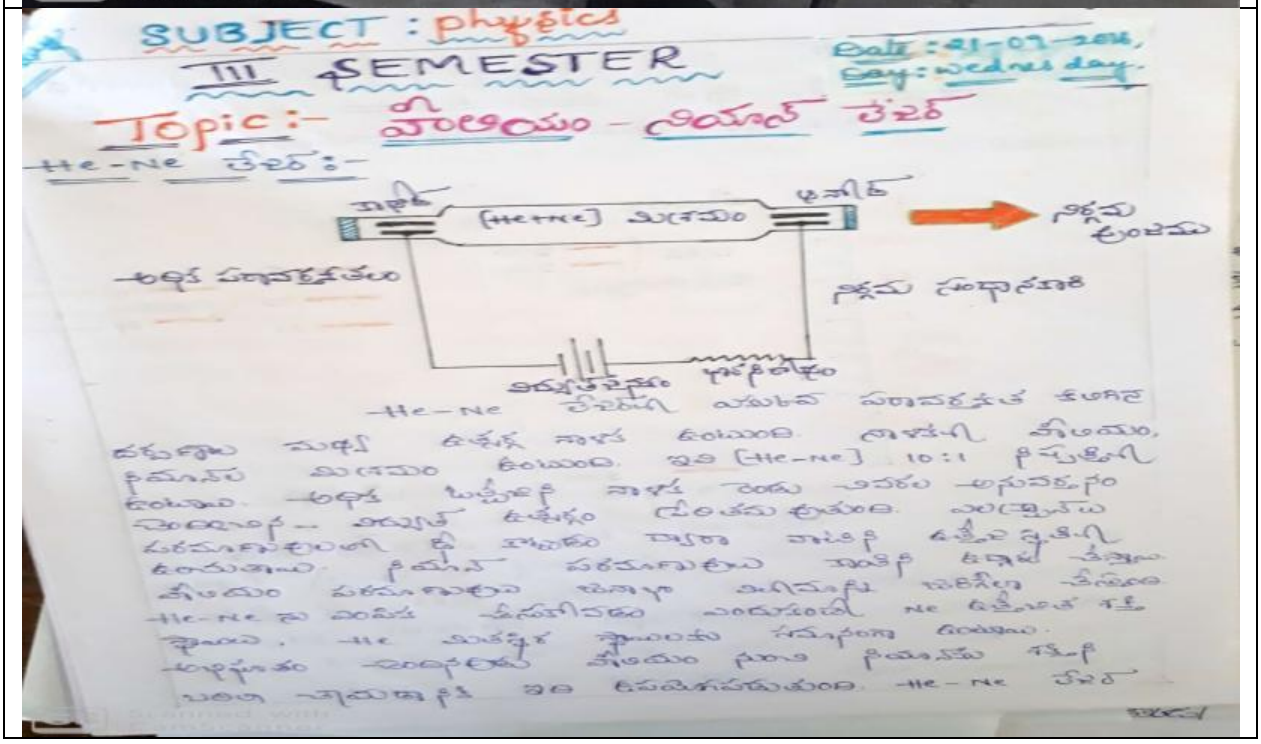
|---|---|---|
| 21-09-16<br>He-Ne Laser | Student Seminars<br>O.Manimala(IIIMPC) | T. Syamala – Guest Faculty in Physics |



# Department of Physics
# ANNUAL REPORT 16-17

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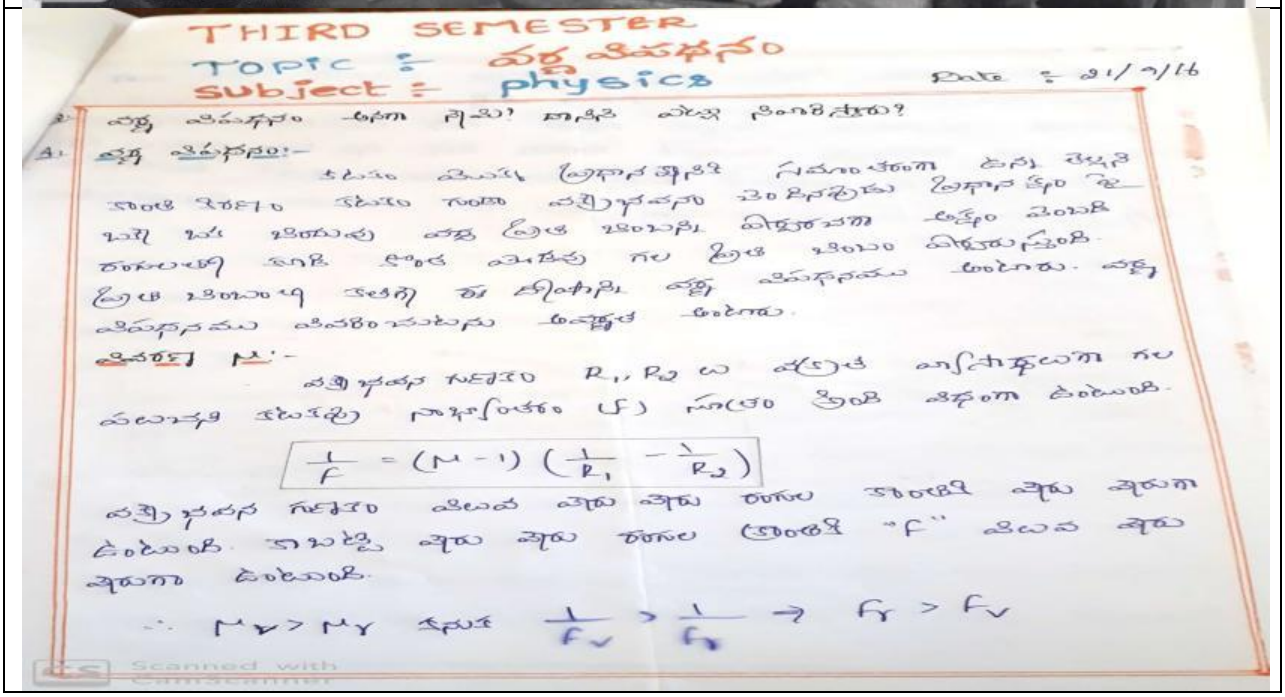
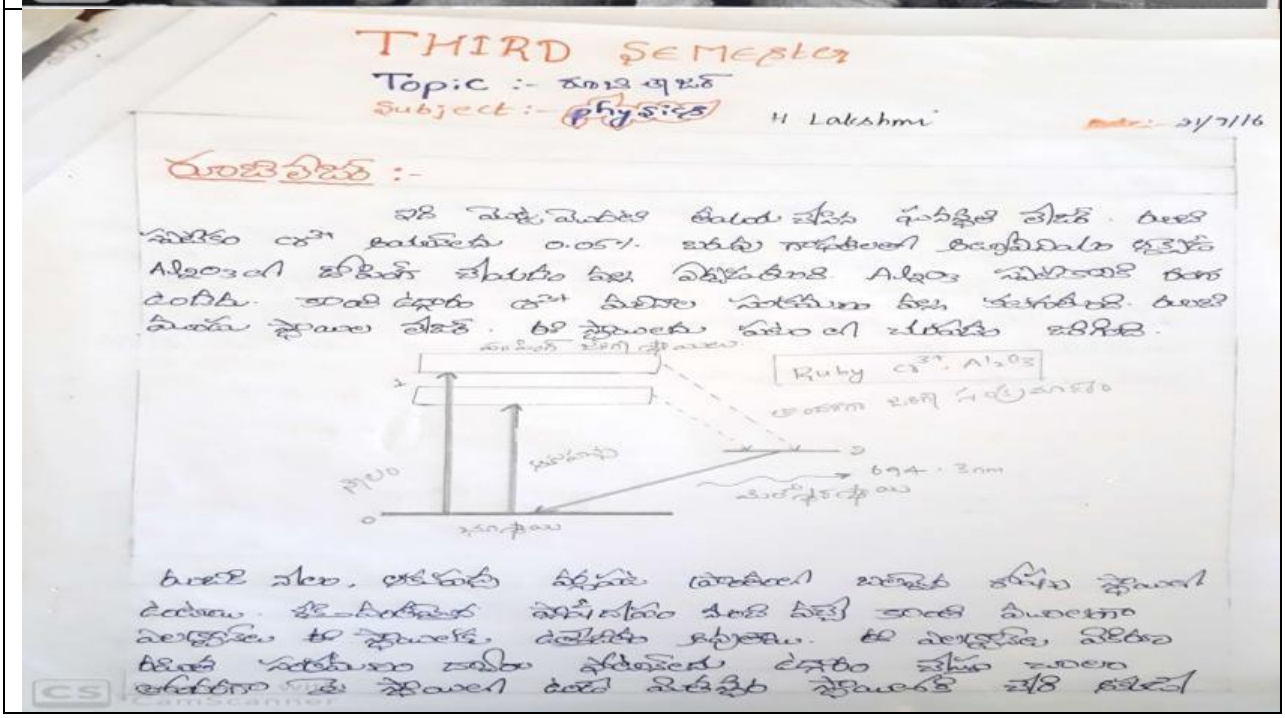
|---|---|---|
| 21-09-16<br>Chromatic Observation | Student Seminars<br>G.Sivalakshmi(IIIMPC) | T. Syamala – Guest Faculty in Physics |

# Department of Physics
# ANNUAL REPORT 16-17

| | | |
|---|---|---|
| 21-09-16<br>Ruby Laser | Student Seminars<br>H. Lakshmi (IIMPC) | T. Syamala – Guest Faculty in Physics |

Name of the Student : H. Lakshmi II B.Sc., (MPC)
Topic : రూబి లేసర్

# Department of Physics
# ANNUAL REPORT 16-17

| | | |
|---|---|---|
| 23-09-16<br>Motion Of Variable Mass's | Student Seminars<br>C.Sravani(IMPC) | T. Syamala – Guest Faculty in Physics |

Activity : Student Seminar Dated: 23/9/2016

1. Name of the Student : C. Sravani I B.Sc., (MPC)

Topic : ద్రవ్యరాశి మారుతున్న వ్యవస్థకు గమన సమీకరణం

KSN Govt Degree college (women) - Ananthapuramu

STUDENT SEMINAR Date : 23/09/2016

* ద్రవ్యరాశి మారుతున్న వ్యవస్థకు గమన సమీకరణం ఉత్పాదించుము.
[రాకెట్ గమన నియమం]

$$M \frac{dv}{dt} = F_{బాహ్యబలం} + V_{సాపేక్ష} \frac{dm}{dt}$$

ఇది రాకెట్ గమనాన్ని తెలిపే సమీకరణం.

M అనేది [రాకెట్ + ఖర్చైన ఇంధనం] ద్రవ్యరాశి, v అనగా రాకెట్ వేగం మరియు రాకెట్‌కు సాపేక్షంగా వెలువడే వాయువుల సాపేక్ష వేగం.

$V_{సాపేక్ష}$ అనగా ప్రతిచర్యా బలం.

$F_{బాహ్య}$ అనగా బాహ్యబలం.

$F_{బాహ్య} = Mg$

$$M \cdot \frac{dv}{dt} = Mg + V_{సాపేక్ష} \frac{dm}{dt}$$

$$dv = \frac{Mg}{M} dt + V_{సాపేక్ష} \frac{dm}{M \cdot dt} dt$$

$$dv = g\,dt + V_{సాపేక్ష} \frac{dm}{M}$$

ఇరువైపులా సమాకలనం చేయగా

$$\int_{V_0}^{V} dv = g\int_{0}^{t} dt + V_{సాపేక్ష} \int_{M_0}^{M} \frac{1}{M} dM$$

$t=0$ వద్ద

ద్రవ్యరాశి $M_0$, వేగం $V_0$

$$[v]_{V_0}^{V} = g[t]_0^t + V_{సాపేక్ష} [\log M]_{M_0}^{M}$$

# Department of Physics
# ANNUAL REPORT 16-17

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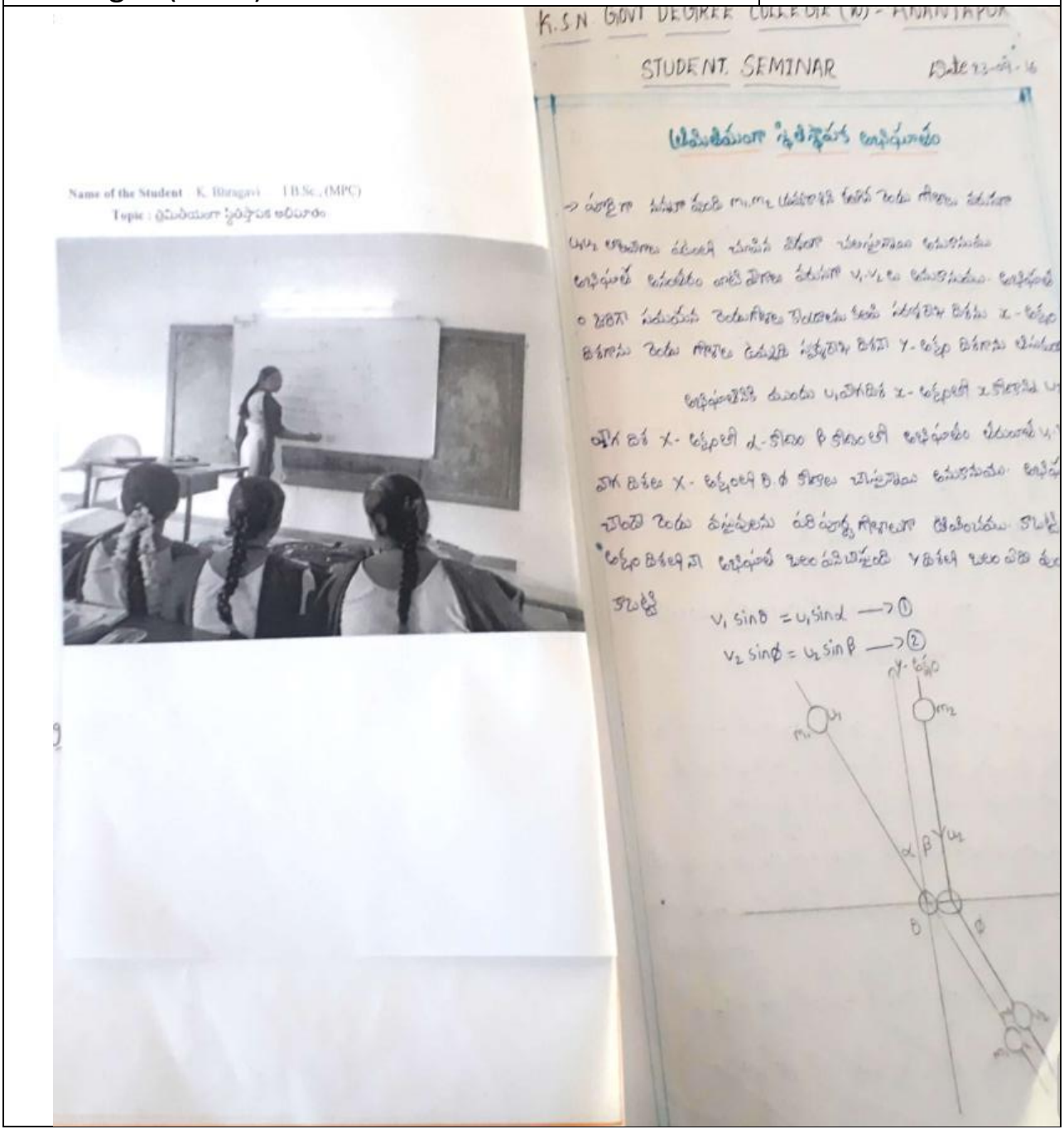
|---|---|
| 23-09-16 Student Seminars<br>Three Dimensional Elastic Collision<br>K.Bhargavi(IMPC) | T. Syamala – Guest Faculty in Physics |



# Department of Physics
# ANNUAL REPORT 16-17

| DATE: 19-08-2016 Guest Lecturer | S. Pavani, Lecturer in Physics |
|---|---|


Anantapuramu,
24.09.16.

From

The Principal,
KSN Govt. Degree College for Women,
Anantapuramu.

To
Dr. R. Padma Suvarna,
Proffessor & Head of the Dept.,
Dept. Of Physics,
JNTUA,
Anantapuramu.

Madam,

Sub: invitation for – delivering Guest Lecture on Diffraction due to Single Slit and Double Slit at our college on 24.09.16 – regarding .

Here by I extend my invitation to you to deliver Guest Lecture on "**Diffraction due to Single Slit and Double Slit**" at our college on 24.09.16. Your presence is highly solicited at our college.

Thanking you,

Yours truly,

PRINCIPAL
KSN Govt. UG College (Women)
ANANTAPUR.

# Department of Physics
# ANNUAL REPORT 16-17

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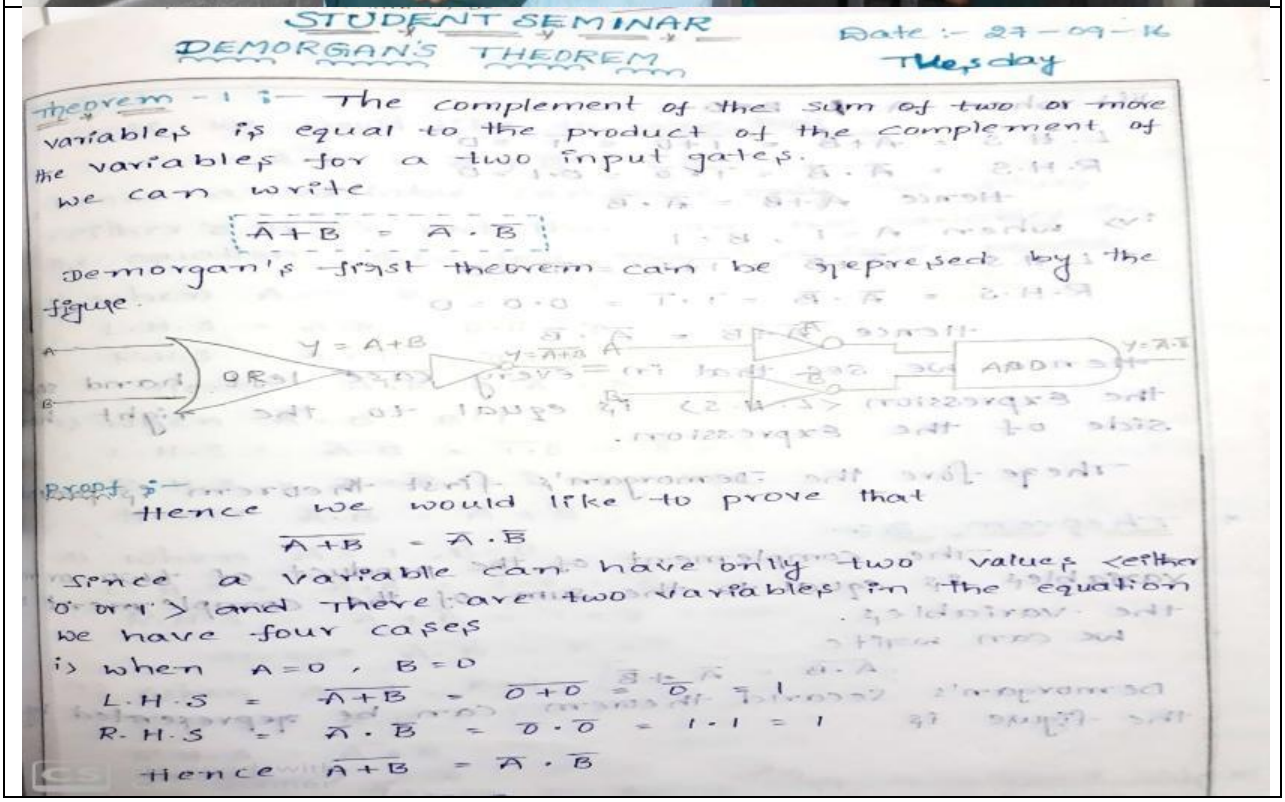
|---|---|---|
| 27-09-16<br>Demorgan's Theorem | Student Seminars<br>Nagalakshmi(IIIMPCs) | S. Pavani, Lecturer in Physics |

STUDENT SEMINAR

DEMORGAN'S THEOREM

Date :- 27-09-16
Tuesday

theorem - 1 :- The complement of the sum of two or more variables is equal to the product of the complement of the variables for a two input gates.
we can write

$$\overline{A+B} = \overline{A} \cdot \overline{B}$$

Demorgan's first theorem can be represented by the figure



proof :-
Hence we would like to prove that

$$\overline{A+B} = \overline{A} \cdot \overline{B}$$

Since a variable can have only two values either '0' or '1' and there are two variables in the equation we have four cases

i) when $A=0$, $B=0$

$$L.H.S = \overline{A+B} = \overline{0+0} = \overline{0} = 1$$
$$R.H.S = \overline{A} \cdot \overline{B} = \overline{0} \cdot \overline{0} = 1 \cdot 1 = 1$$

Hence $\overline{A+B} = \overline{A} \cdot \overline{B}$

# Department of Physics
# ANNUAL REPORT 16-17

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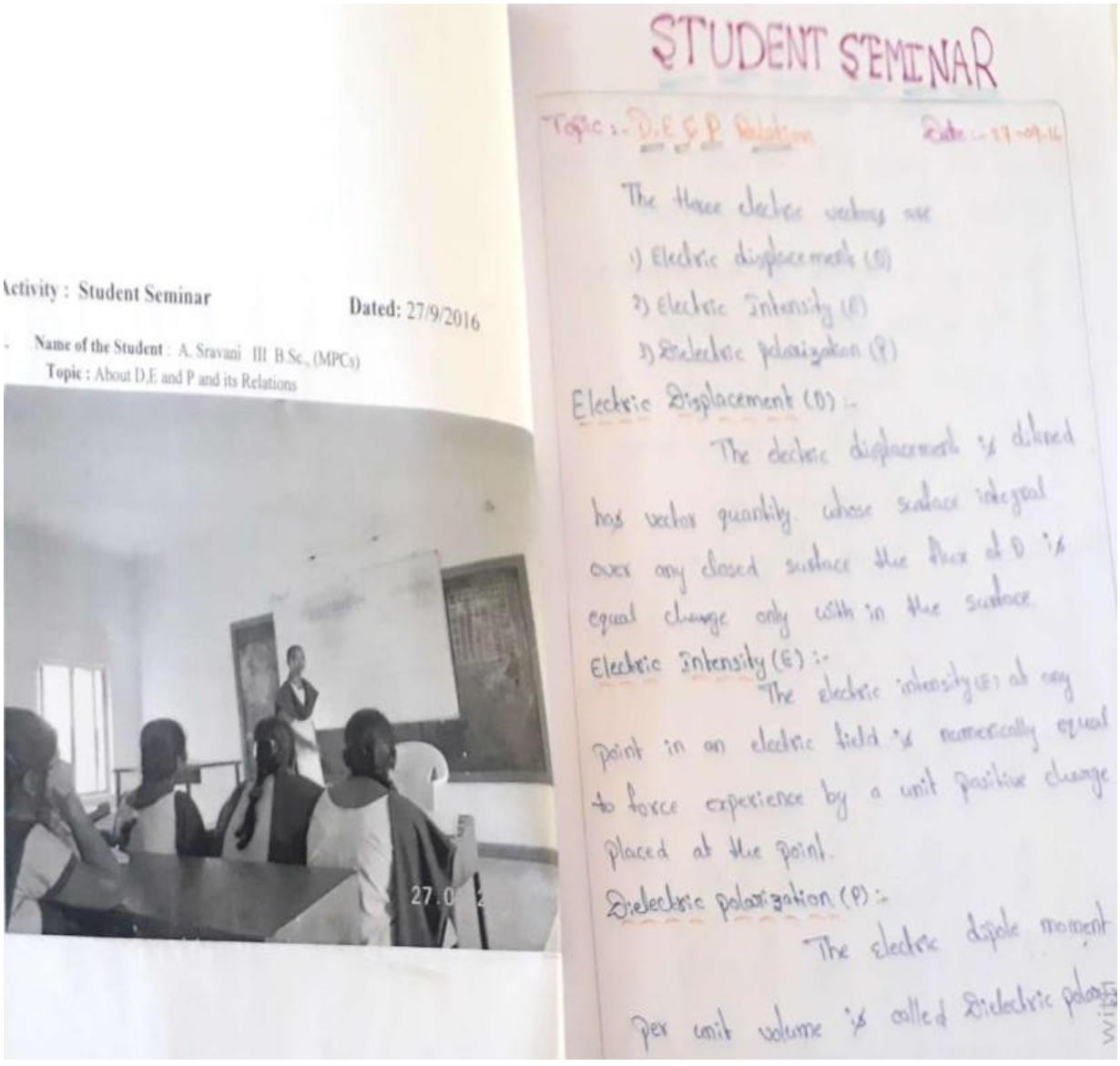
|---|---|---|
| 27-09-16<br>D.E &P Relation | Student Seminars<br>A.Sravani(IIIMPCs) | S. Pavani, Lecturer in Physics |



# Department of Physics
# ANNUAL REPORT 16-17

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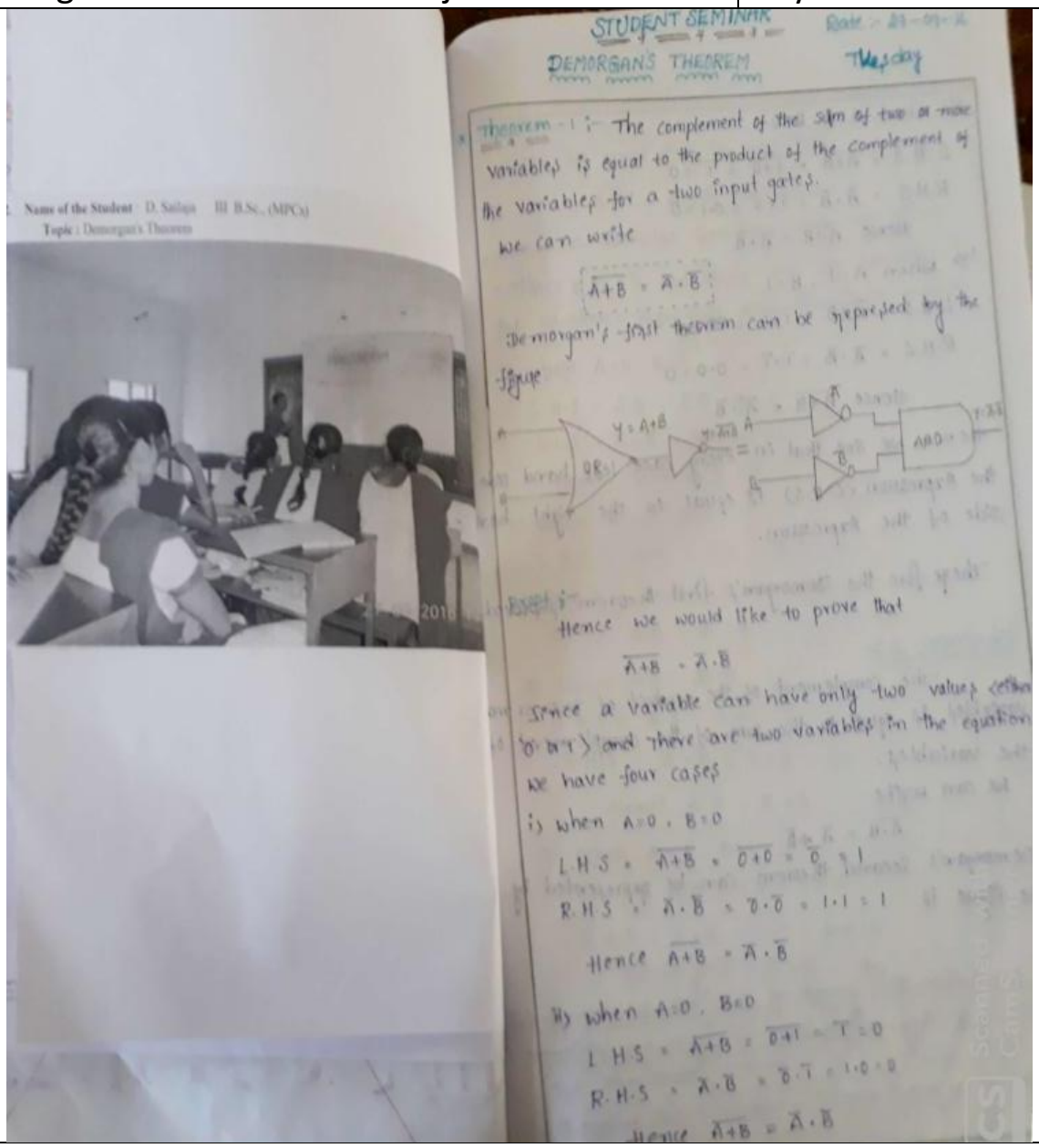
|---|---|---|
| 27-09-16<br>Demorgon's Theorem | Student Seminars<br>D.Sailaja | S. Pavani, Lecturer in Physics |



# Department of Physics
# ANNUAL REPORT 16-17

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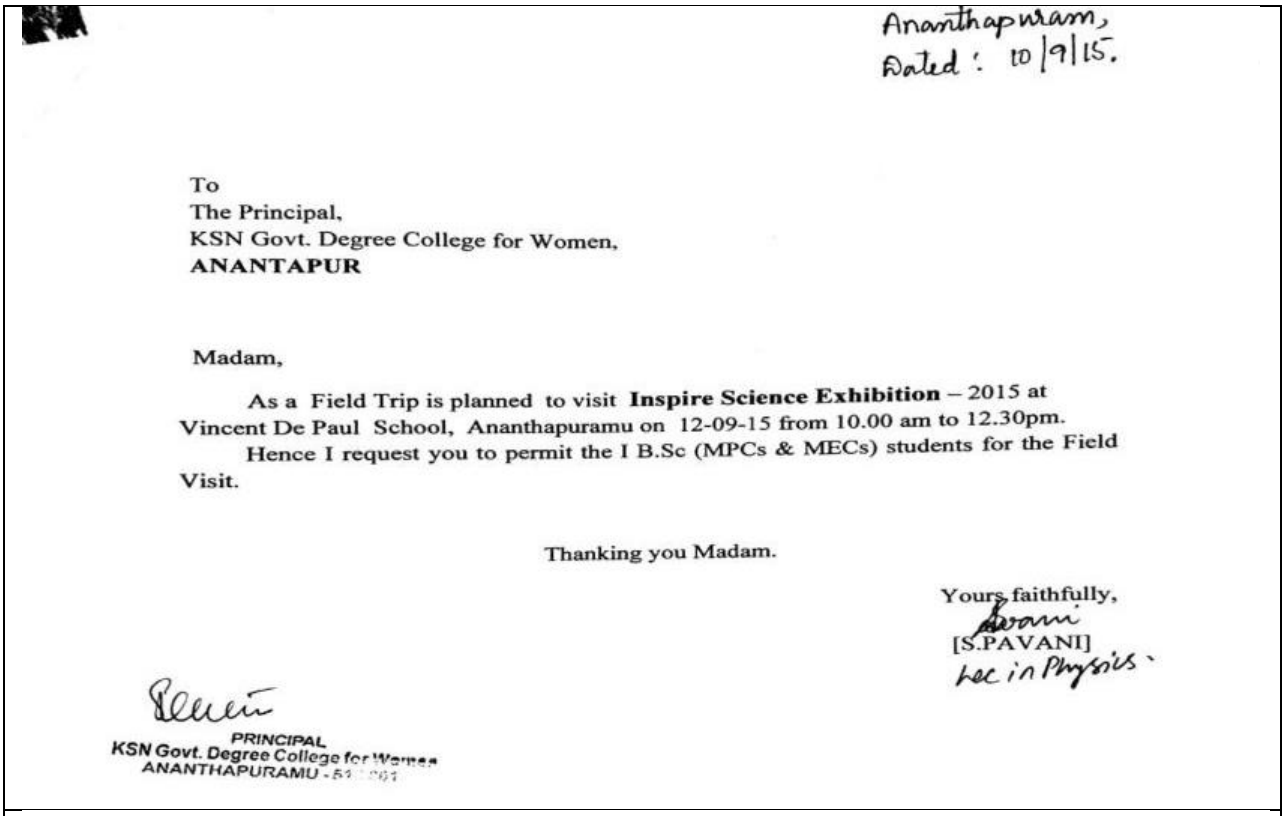
|---|---|
| DATE: 05-10-2016 Guest Lecturer | S. Pavani, Lecturer in Physics |


# Department of Physics
# ANNUAL REPORT 16-17



Ananthapuram,
Dated: 10/9/15.

To
The Principal,
KSN Govt. Degree College for Women,
**ANANTAPUR**

Madam,

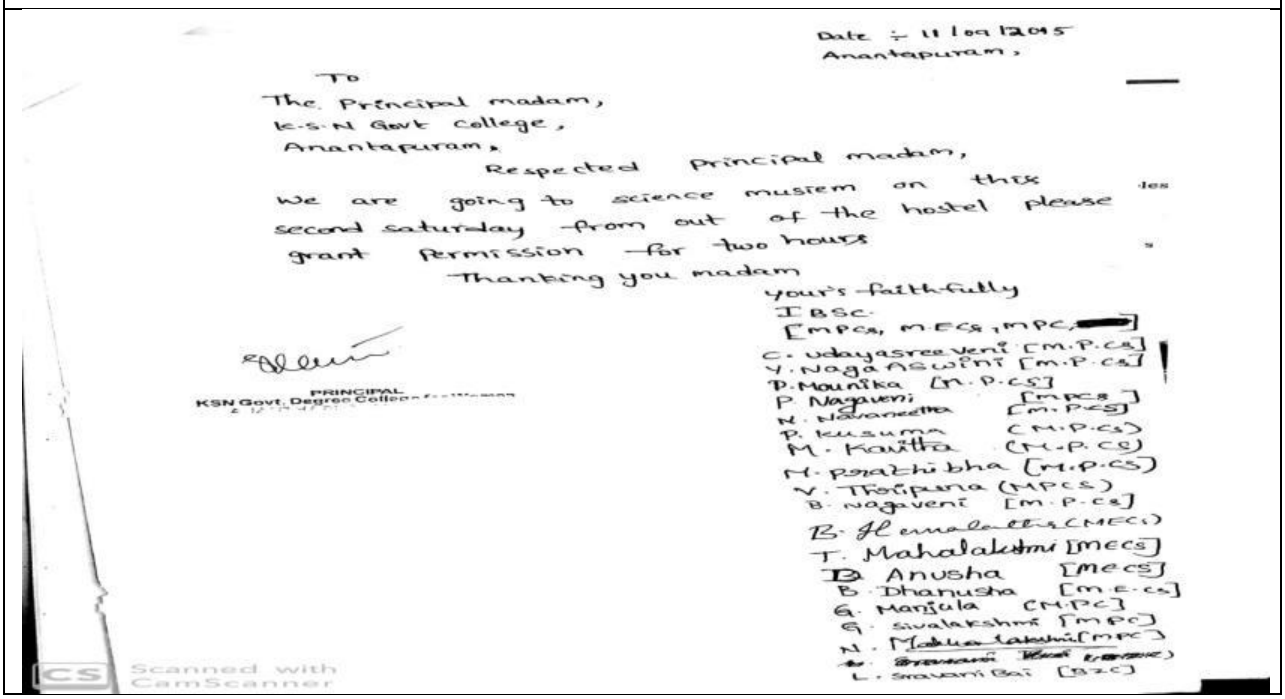
As a Field Trip is planned to visit **Inspire Science Exhibition** – 2015 at Vincent De Paul School, Ananthapuramu on 12-09-15 from 10.00 am to 12.30pm.

Hence I request you to permit the I B.Sc (MPCs & MECs) students for the Field Visit.

Thanking you Madam.

Yours faithfully,
[S.PAVANI]
Lec in Physics.

PRINCIPAL
KSN Govt. Degree College for Women
ANANTHAPURAMU - 51 [illegible]



Date: 11/09/2015
Ananthapuram.

To
The Principal madam,
K.S.N Govt college,
Anantapuram.

Respected principal madam,

We are going to science mustem on this second saturday from out of the hostel please grant Permission for two hours

Thanking you madam

Yours faithfully
I BSC.
[MPCs, MECs, MPC[redacted]]
C. udayasreevani [M.P.Cs]
Y. Naga Aswini [M.P.Cs]
P. Manika [M.P.Cs]
P. Nagaveni [MPCs]
N. Navaneetha [M.P.Cs]
P. kusuma [M.P.Cs]
M. Kavitha [M.P.Cs]
M. Prakhibha [M.P.Cs]
V. Thripura (MPCs)
B. nagaveni [M.P.Cs]
B. Hemalatha (MECs)
T. Mahalakshmi [MECs]
B. Anusha [MECs]
B. Dhanusha [M.E.Cs]
G. Manjula [M.P.C]
G. Sivalakshmi [MPC]
N. Mahesh [illegible] [MPC]
[illegible]
L. Sravani Bai [BZC]

PRINCIPAL
KSN Govt. Degree College [illegible]

# Department of Physics
# ANNUAL REPORT 16-17

| DATE: 19-10-2016 Guest Lecturer | S. Pavani, Lecturer in Physics |
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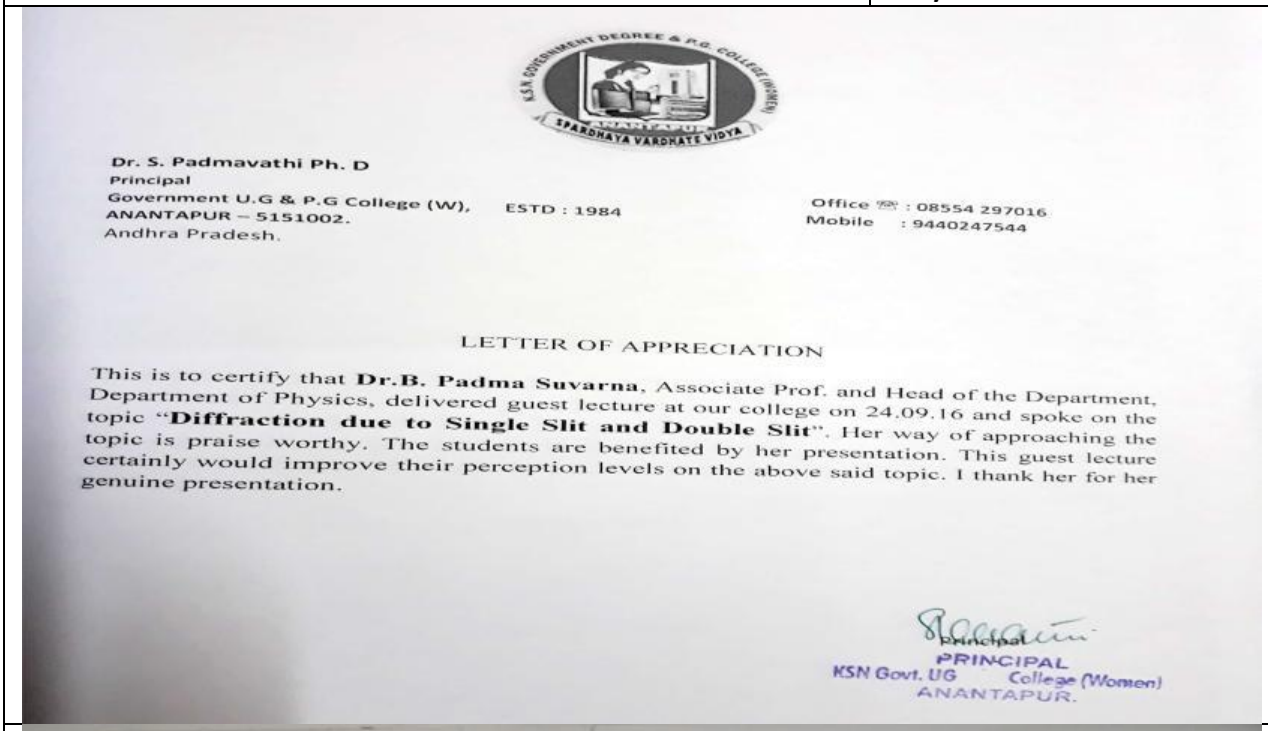


KSN GOVERNMENT DEGREE & P.G. COLLEGE (WOMEN)
SWADHYAYA VARDHATE VIDYA

Dr. S. Padmavathi Ph. D
Principal
Government U.G & P.G College (W), ESTD : 1984
ANANTAPUR – 5151002.
Andhra Pradesh.

Office : 08554 297016
Mobile : 9440247544

LETTER OF APPRECIATION

This is to certify that **Dr.B. Padma Suvarna**, Associate Prof. and Head of the Department, Department of Physics, delivered guest lecture at our college on 24.09.16 and spoke on the topic "**Diffraction due to Single Slit and Double Slit**". Her way of approaching the topic is praise worthy. The students are benefited by her presentation. This guest lecture certainly would improve their perception levels on the above said topic. I thank her for her genuine presentation.

Principal
PRINCIPAL
KSN Govt. UG College (Women)
ANANTAPUR.

# Department of Physics
# ANNUAL REPORT 16-17

| DATE:26-10-2016<br>QUIZ | Department Of Physics |
|---|---|


# Department of Physics
# ANNUAL REPORT 16-17

# Department of Physics
# ANNUAL REPORT 16-17

Quiz – 2016

Class : III MPCs

Subject : Physics Paper – IV

Round ①

1) What are the postulates of Vector Atom Model.
   a) Concept of Spatial Quantization
   b) Concept of Electron Spin.

2) What are the quantum numbers associated with the vector atom model in the presence of magnetic field. (Any Two)
   a) Magnetic Orbital Quantum Number (ml)
   b) Magnetic Spin Quantum Number (ms)
   c) Magnetic Total Angular momentum Quantum Number (mj)

3) Give the atomic number of Silver (Ag) along with electronic configuration

Ag – 47

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1 4d^{10}$

4) Define ~~Zeeman Effect~~
Derive expression for the displacement of the position of the electron in the presence of non homogeneous magnetic field.

$$S = \frac{1}{2}\left(\frac{\partial B}{\partial y}\right)\left(\frac{\mu_x}{m}\right)\left(\frac{L}{v_x}\right)^2$$

Round ② : –

5) Define Zeeman Effect.
When a source of radiation is placed in a magnetic field the spectral lines are split into a number of component lines symmetrically distributed about the original line.

6) Define Paschen – Back Effect :
The transition of anomalous Zeeman Effect into Normal Zeeman Effect in the presence of magnetic field as the field strength is progressively increased.

7) Stark Effect
The splitting up of spectral lines due to the action of an external electric field.

8) Raman Effect:
A monochromatic light passed through a gas, liquid and transparent material, a small fraction of light is scattered in all directions. The spectrum of scattered light consists of greater and smaller than that of the original frequency

Round (3) :-

9) Inelastic Scattering:
The incident particle leaves apart of its KE in exciting the target

$$_3Li^7 + {}_1H^1 \longrightarrow [{}_3Li^7]^* + {}_1H^1$$

10) Radiative Capture
The incident particle is captured by the target nucleus.

$$_6C^{12} + {}_1H^1 \longrightarrow [{}_7N^{13}]^* \longrightarrow {}_7N^{13} + \gamma$$

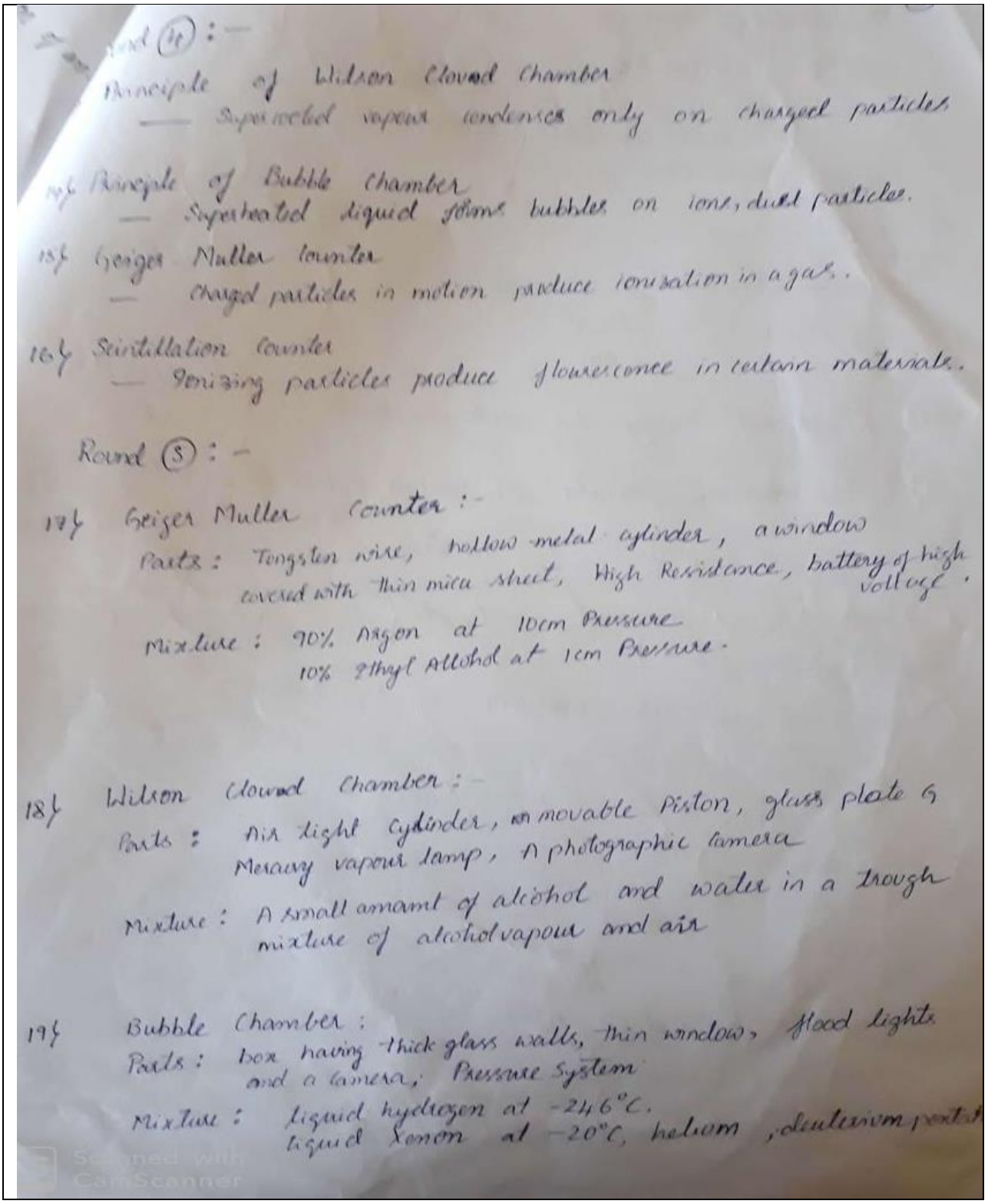
11) Photo Disintegration
Target materials are bombarded with radiations like $\gamma$-rays, formation of compound nucleus.

$$_1H^2 + \gamma \longrightarrow [{}_1H^2] \longrightarrow {}_1H^1 + {}_0n^1$$

12) Spontaneous Decay
The phenomenon of natural radioactivity during which $\alpha$, $\beta$ and $\gamma$-radiations are emitted

$$_{92}U^{238} \longrightarrow {}_{90}Th^{234} + {}_2He^4 \ (\alpha\text{-particle})$$

# Department of Physics
# ANNUAL REPORT 16-17



Round (4) :-

Principle of Wilson Clowed Chamber
— Supersaturated vapour condenses only on charged particles.

Principle of Bubble Chamber
— Superheated liquid forms bubbles on ions, dust particles.

Geiger Muller counter
— Charged particles in motion produce ionisation in a gas.

Scintillation Counter
— Ionizing particles produce flourescence in certain materials.

Round (5) :-

Geiger Muller Counter :-
Parts : Tongsten wire, hollow metal cylinder, a window covered with thin mica sheet, High Resistance, battery of high voltage.
Mixture : 90% Argon at 10cm Pressure
10% Ethyl Alcohol at 1cm Pressure.

Wilson Clowed Chamber :-
Parts : Air tight cylinder, a movable Piston, glass plate & Mercury vapour lamp, A photographic camera
Mixture : A small amount of alcohol and water in a trough mixture of alcohol vapour and air

Bubble Chamber :
Parts : box having thick glass walls, thin window, flood lights and a camera, Pressure System
Mixture : liquid hydrogen at -246°C.
liquid Xenon at -20°C, helium, deuterium, neon

20) Scintillation Counter

Parts : Scintillation chamber, photo multiplier tube, dynod electronic counter & photocathode.

Scintillation chamber (aluminium casing

Mixture : Scintillation Crystal.

Round (6) :—

21) Change in wavelength of a spectral line in Zeeman effect is

$$d\lambda = \frac{Be\lambda^2}{4\pi mc}.$$

22) Rotational Energy of a diatomic molecule $E_x = \frac{J(J+1)\hbar}{2I}$.

23) The Empirical formula for nuclear radius $R = R_0 A^{1/3}$

$R_0 = 1.3 \times 10^{-15}$ m.

24) Range of $\alpha$-particle $R = bE^{3/2}$

Round (7) :- (Tic)

Semi Empirical Mass formula of liquid drop.

$$B.E = E_V + E_S + E_C + E_{AS} \pm \delta$$
$$= E_V - E_S - E_C - E_{AS} \pm \delta.$$

~~$E_V = -bA^{2/3}$~~

$E_V = a.A$

$E_S = -bA^{2/3}$

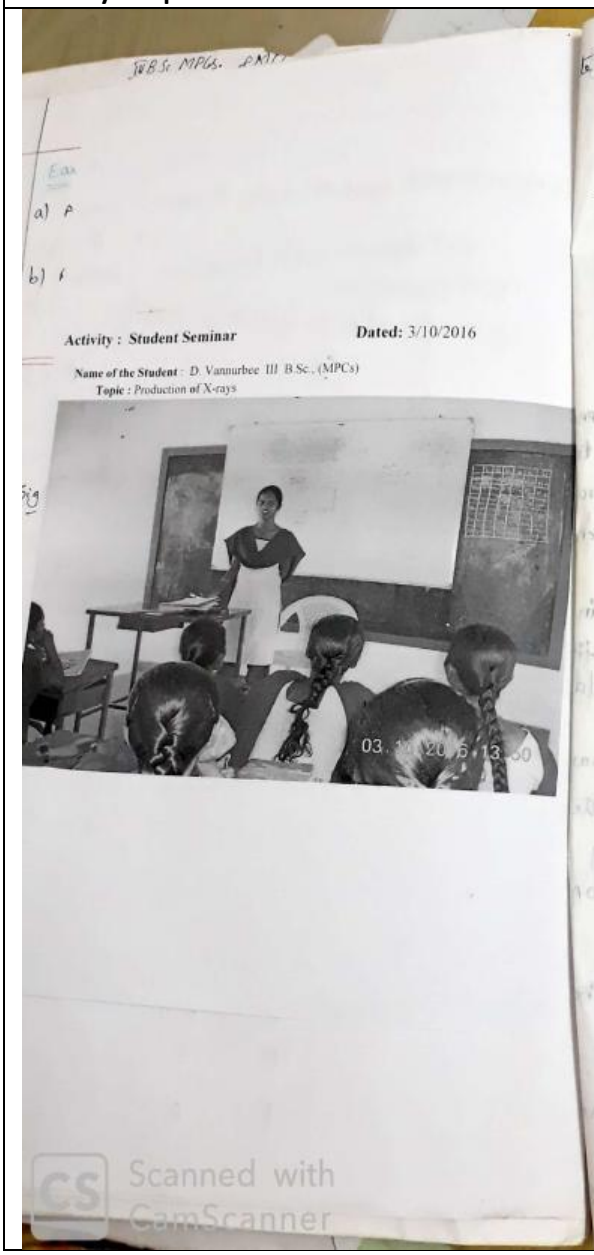
$E_C = E - \frac{cZ^2}{A^{1/3}}$

$E_{AS} = -\frac{d(A-2A)^2}{A}$

$E_S = \frac{O_P}{A^{3/4}}$.

# Department of Physics
# ANNUAL REPORT 16-17

| | | |
|---|---|---|
| 31-10-16<br>X-Rays Spectra | Student Seminars<br>D.Vannur Bee (IIIMPCs) | S. Pavani, Lecturer in Physics |



Activity : Student Seminar Dated: 3/10/2016

Name of the Student : D. Vannurbee III B.Sc.,(MPCs)

Topic : Production of X-rays





Date: 3-10-2016.

## X-Ray Spectra SEMINAR

D. Vannur bee
III BSc MPCs
Roll NO-5

### Discovery of X-ray:-

Rontgen in 1895 discovered the x-rays when he was studying the phenomenon of discharge of electricity through rarefied gases.

Rontgen concluded that when a beam of fast-moving electrons strike a solid target, an visible high Penetrating radiation is produced because of their unknown nature Rontgen called these radiation as x-rays. Actually x-rays are electromagnetic waves of very short wavelength.

### Production of X-rays:-

The x-rays are produced when fast moving electrons strike a target of suitable material.

They are two types of x-rays tubes, namely

(a) The gas filled or Rontgen x-rays tube,

(b) The modern coolidge tube or hot filament tube

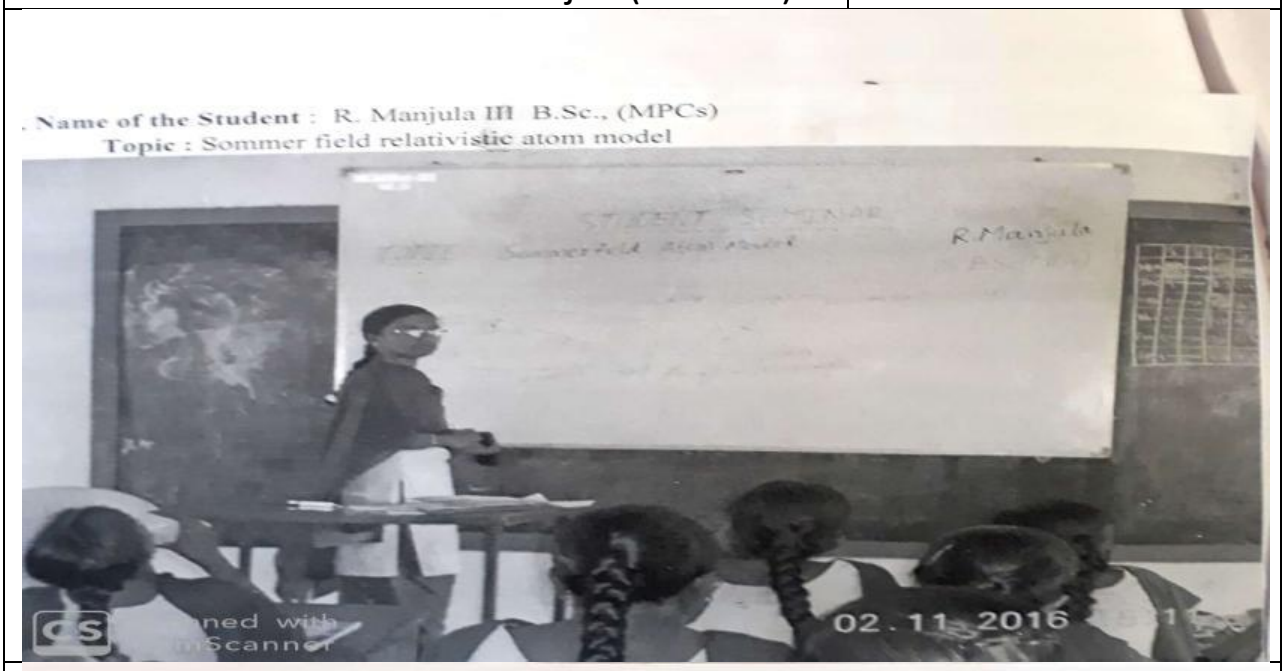
Now we will discuss the modern coolidge tube

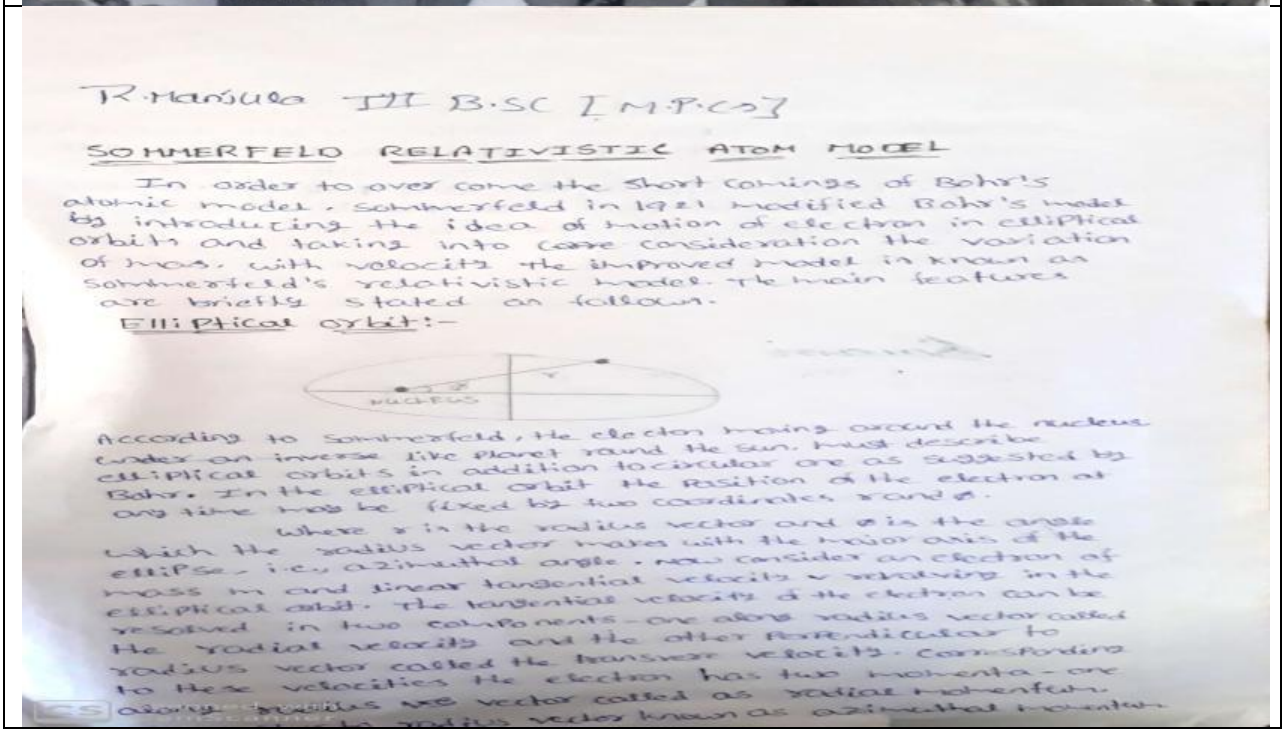
### Modern coolidge Tube:-

It consists of highly evacuated hard glass bulb containing a cathode and anode the cathode consists of a tungsten filament f and is heated by passing a current through it from a low tension of 5-10 volts (or)...

# Department of Physics
# ANNUAL REPORT 16-17

| | | |
|---|---|---|
| 02-11-16<br>Sommer field Relativistic | Student Seminars<br>Atom Model<br>R.Manjula(III MPCs) | S. Pavani, Lecturer in Physics |



R.Manjula III B.SC [M.P.Cs]

SOMMERFELD RELATIVISTIC ATOM MODEL

In order to over come the short comings of Bohr's atomic model, Sommerfeld in 1921 modified Bohr's model by introducing the idea of motion of electron in elliptical orbits and taking into consideration the variation of mass with velocity the improved model is known as Sommerfeld's relativistic model. The main features are briefly stated as follows.

Elliptical orbit:-




According to Sommerfeld, the electron moving around the nucleus under an inverse like planet round the sun, must describe elliptical orbits in addition to circular one as suggested by Bohr. In the elliptical orbit the position of the electron at any time may be fixed by two coordinates r and $\phi$.

where r is the radius vector and $\phi$ is the angle which the radius vector makes with the major axis of the ellipse - i.e., azimuthal angle. Now consider an electron of mass m and linear tangential velocity v revolving in the elliptical orbit. The tangential velocity of the electron can be resolved in two components - one along radius vector called the radial velocity and the other perpendicular to radius vector called the transverse velocity. Corresponding to these velocities the electron has two momenta - one along radius vector called as radial momentum. and another perpendicular to radius vector known as azimuthal momentum.

# Department of Physics
# ANNUAL REPORT 16-17

| DATE:11-03-2016 Field Trip | |
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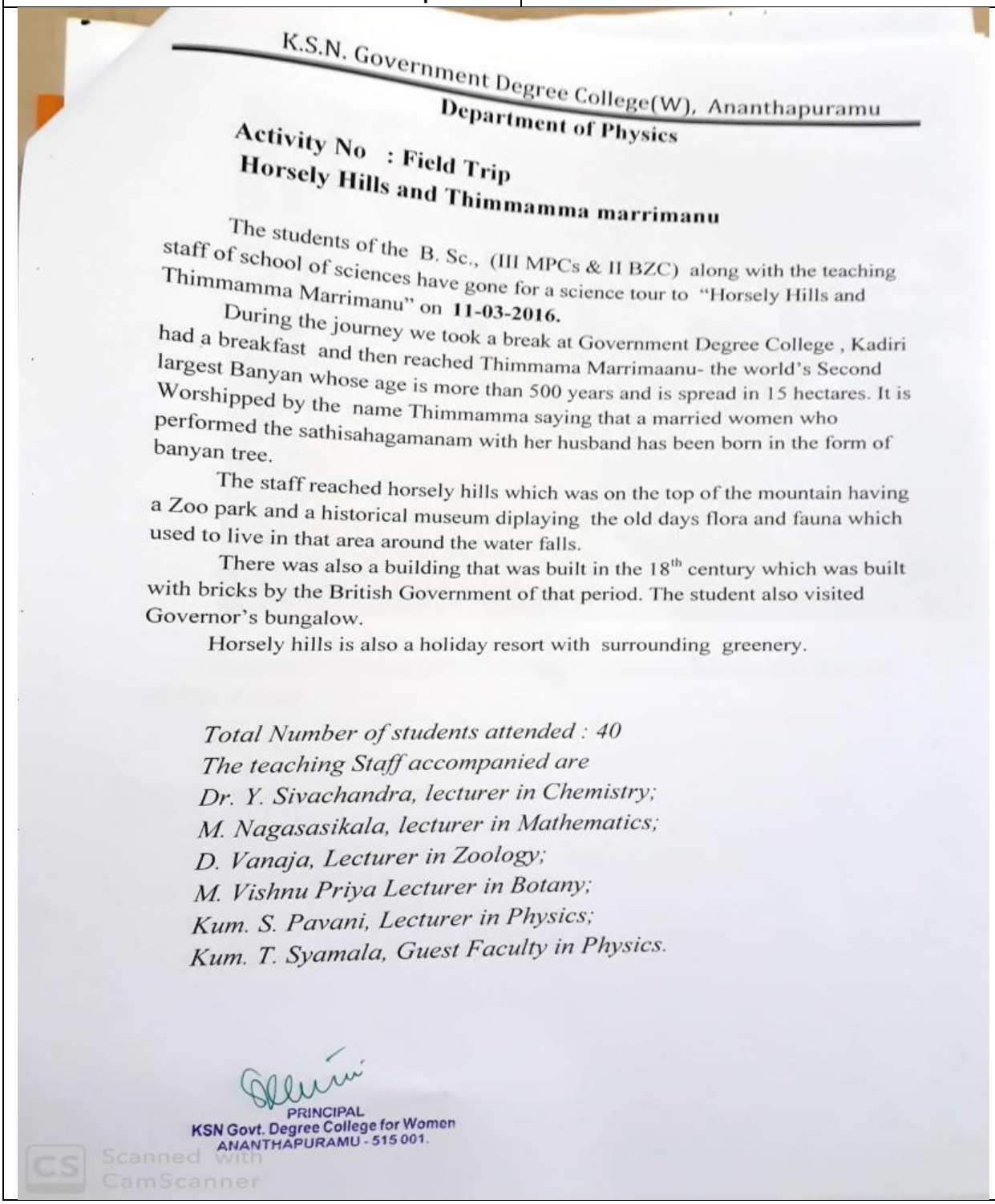

K.S.N. Government Degree College(W), Ananthapuramu
**Department of Physics**

**Activity No : Field Trip**
**Horsely Hills and Thimmamma marrimanu**

The students of the B. Sc., (III MPCs & II BZC) along with the teaching staff of school of sciences have gone for a science tour to "Horsely Hills and Thimmamma Marrimanu" on **11-03-2016.**

During the journey we took a break at Government Degree College , Kadiri had a breakfast and then reached Thimmama Marrimaanu- the world's Second largest Banyan whose age is more than 500 years and is spread in 15 hectares. It is Worshipped by the name Thimmamma saying that a married women who performed the sathisahagamanam with her husband has been born in the form of banyan tree.

The staff reached horsely hills which was on the top of the mountain having a Zoo park and a historical museum diplaying the old days flora and fauna which used to live in that area around the water falls.

There was also a building that was built in the 18th century which was built with bricks by the British Government of that period. The student also visited Governor's bungalow.

Horsely hills is also a holiday resort with surrounding greenery.

*Total Number of students attended : 40*
*The teaching Staff accompanied are*
*Dr. Y. Sivachandra, lecturer in Chemistry;*
*M. Nagasasikala, lecturer in Mathematics;*
*D. Vanaja, Lecturer in Zoology;*
*M. Vishnu Priya Lecturer in Botany;*
*Kum. S. Pavani, Lecturer in Physics;*
*Kum. T. Syamala, Guest Faculty in Physics.*

PRINCIPAL
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# Department of Physics
# ANNUAL REPORT 16-17

K.S.N. Government Degree College(W), Ananthapuramu

**Department of Physics**


**Students and the staff in front of the tour bus before starting their journey**

**Students inside the bus**

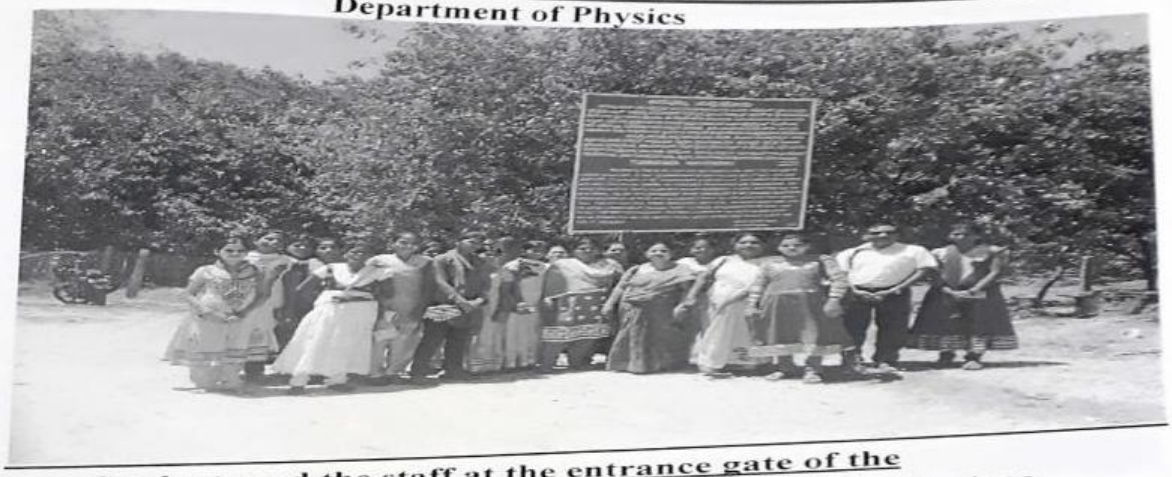
PRINCIPAL
KSN Govt. Degree College for Women
ANANTHAPURAMU - 515 001.

S.PAVANI, M.Sc.,
Lecturer in Physics
KSN Govt. Degree College (W)
ANANTHAPURAM (A.P.) 515 002

# Department of Physics
# ANNUAL REPORT 16-17

K.S.N. Government Degree College(W), Ananthapuramu

**Department of Physics**

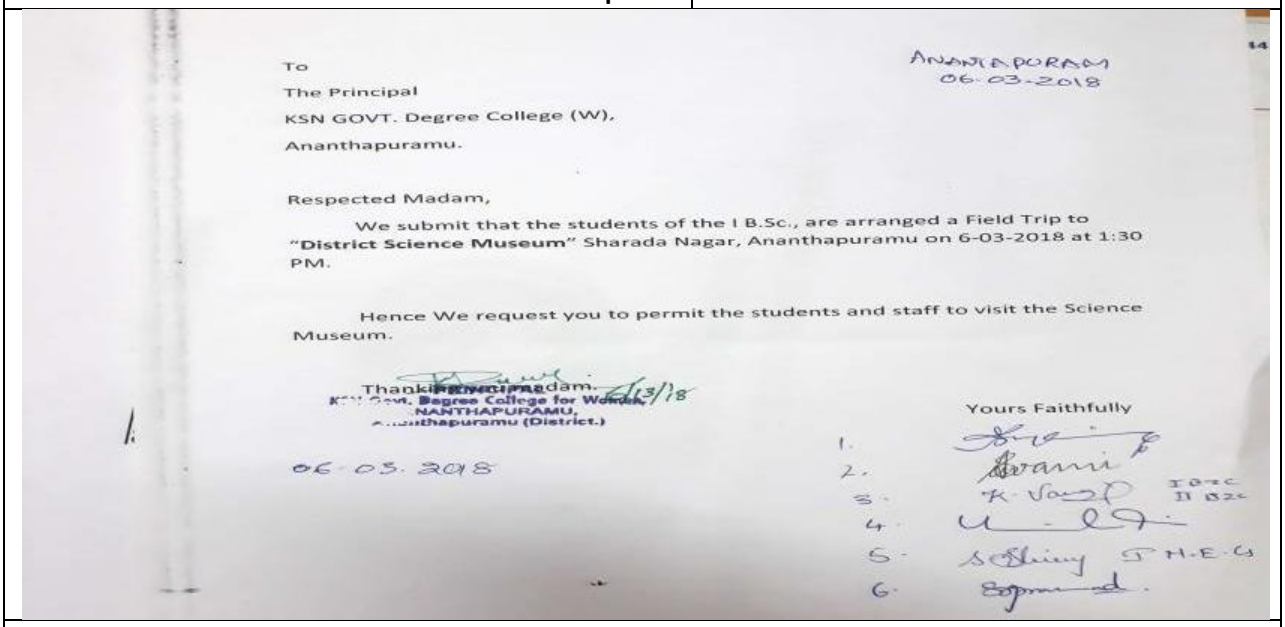


**Students and the staff at the entrance gate of the Thimmama marrimanu – world's second largest Banyan tree**

**Students at the entrance of Zoo – park at the horsely hills**

# Department of Physics
# ANNUAL REPORT 16-17

| DATE:06-03-2016 | Field Trip | |
|---|---|---|



To
The Principal
KSN GOVT. Degree College (W),
Ananthapuramu.

ANANTAPURAM
06-03-2018

Respected Madam,

We submit that the students of the I B.Sc., are arranged a Field Trip to "**District Science Museum**" Sharada Nagar, Ananthapuramu on 6-03-2018 at 1:30 PM.

Hence We request you to permit the students and staff to visit the Science Museum.

Thanking you Madam.

Govt. Degree College for Women,
NANTHAPURAMU,
Ananthapuramu (District.)

06-03-2018

Yours Faithfully

1.
2.
3.
4.
5.
6.

Field Visit To Science Museum on 06-03-2018 by Department of Physics & Electronics

# Department of Physics
# ANNUAL REPORT 16-17

| Digital Assignments Y.Nagaswini<br>Compound nucleus And direct Reactuins | Department of Physics |
|---|---|


## Compound nucleus

Bohr on the basis of liquid drop model explained the process of nuclear reactions. According to Bohr, when a nuclear particle strikes the nucleus, it is captured by the nucleus and a compound nucleus is formed. The compound nucleus is similar in action to a heated up liquid drop. Now the projectile particle loses its identity and its all energy is distributed among all the particles of the newly formed compound nucleus. The compound nucleus is in the excited state, of course, no particle has sufficient energy to escape from the compound nucleus. However , after a considerable gap of time , the particle acquires sufficient excess energy and escapes from the nucleus. The process of escaping is known as disintegration or transmutation. This is similar process like the evaporation of particles from the surface of a liquid drop.

Bohr offered the following general scheme for nuclear reaction.

$A+B \rightarrow C \rightarrow P+Q$.

Where A represents a nucleus bombarded by a nuclear projectile B and consequently a compound nucleus C is formed. Again the compound nucleus C disintegrates into outgoing particle Q and residual P. The outgoing particle may be material particle or it may be emission of γ rays. Hence , the nuclear reactions may be of the following two types:

(i)Particle disintegration process

The process in which outgoing particle is a material particle, and

(ii)simple capture process

In this process the outgoing emission consists of γ rays .

Here it should be remembered that particle disintegration process is more probable than simple capture process.

In some cases the residual nucleus p may be left either in the ground state or an excited state or an excited state. This depends upon the kinetic energy of the outgoing particle O. when the outgoing particle O has a high kinetic energy, the residual p is left in excited state. If the residual nucleus is left in the excited state, it further disintegrates to give

$P \rightarrow D+S$.

Where D represents the second residual nucleus and S is the second outgoing particle.

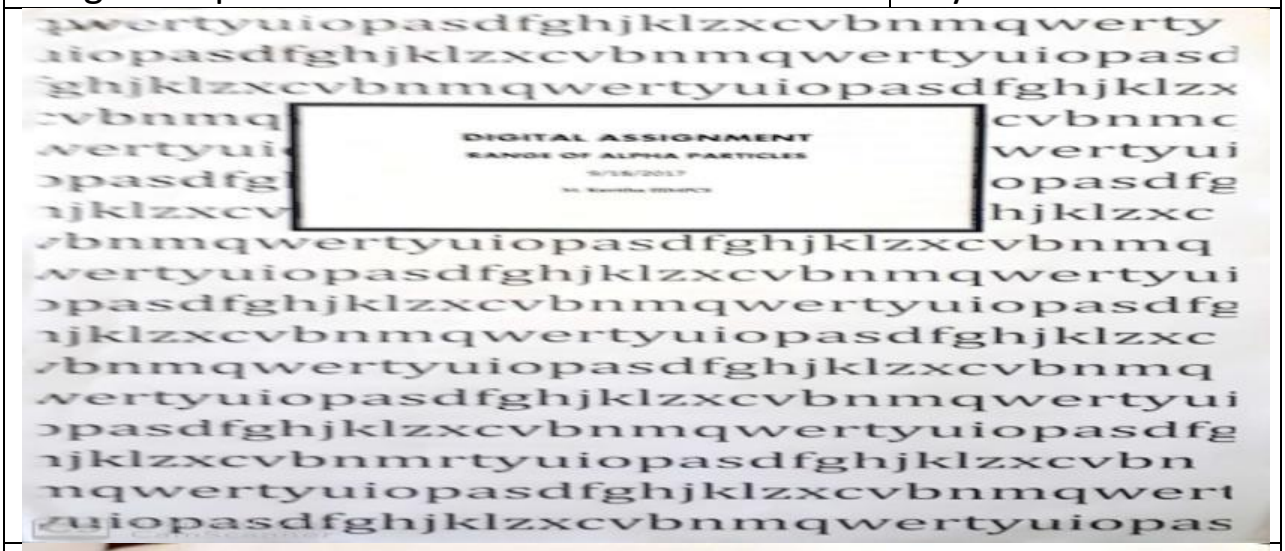
Here it should be noted that

(a) Atomic number of A+ Atomic number=atomic number of P + Atomic number of Q
(b) Mass number of A+ Mass number of B=Mass number of P+ Mass number of Q

## Direct reactions

# Department of Physics
# ANNUAL REPORT 16-17

| Digital Assignments<br>Range of Alpha Particle | M.Keerthana | Department of Physics |
|---|---|---|



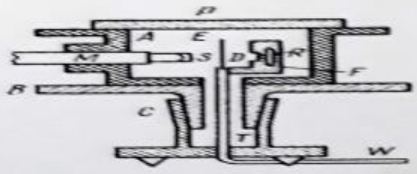

**RANGE OF α-PARTICLES:-**

We know that α-particles have a large amount of energy but they are not very penetrating i.e., they are easily stopped by an ordinary sheet of paper. W.H.Bragg had suggested that when α-particles passes through a gas in straight line path it collides with the atoms and molecules of the gas and ionizes them. It loses energy continuously , by ionizing the atoms and molecules of the gas until its velocity reduced to a value such that it does not carry enough energy to ionize the gas particles, i.e., its energy reduces below the ionization energy. Thus after traversing a certain distance in a gas , a particle loses its ionizing power, photographic action and fluorescene effect. **The range of α-particles is customarily defined as the distance which these particles travel through air at 76cm of mercury pressure and 15°c temperature before they lose their energy to the extent that they no longer ionize the gas particles.** The range of α-particles depend upon the following factors

i. Initial velocity of α-particle
ii. Nature of emitting radioactive element
iii. Nature and pressure of the gas or nature of absorber.

**Experimental measurement of the range of α-particles :-**

In 1904 , Bragg and Kleeman devised an apparatus to determine the range of α-particles in a gas at different pressures. The apparatus is as shown in the figure. A is a glass tube about 100cm long. The radioactive sample under investigation is placed at s at the bottom of lead box B provided with an adjustable rod. The rod can be raised up or down and can be clamped at the required position. The tube can be exhausted and can be filled with any gas at the required pressure. The pressure of the gas can be measured by a manometer. The α-rays emerge through the opening O and form a narrow conical pencil. The ionization produced by α-particles emitted by the source is measured by the ionization chamber. The ionizing chamber consists of plate P and grid G. The ionization current produced by this chamber can be detected and measured by



# Department of Physics
# ANNUAL REPORT 16-17

| Digital Assignments M.Prathiba(IIIMPCs) Geiger's Law And Geiger Nuttal Law | Department of Physics |
|---|---|

K.S.N. GOVT. DEGREE COLLEGE(W)

ANANTHAPURAMU

PHYSICS DIGITAL ASSIGNMENT

NAME: M. PRATHIBA

GROUP:III B.SC. MPCS E/M

TOPIC: GEIGER'S LAW AND GEIGER NUTTAL LAW

## GEIGER'S NUTTAL LAW:

We know that different of alpha emitters of different energies and hence of different ranges. It has been obserbed that alpha emitters giving their higher energy particles have the shortest – half of lives and vice versa.

Geiger and Nuttal measured the range of alpha particle emitted by several radioactivity elements and found that their exist a regular relation between the ranges and half lives of the elements. The relation is expressed as

$$\text{Log } \lambda = A + B \log R$$

Where R is the range alpha particle emitted by a element. $\lambda$ is disintegration constant. A and B are constants. This relation is called as geiger's nuttal law.

The law is helpful determining roughly the decay constant of radio active substance of very short or very long lives.

We can draw a very important conclusion from Geiger nuttal law that when the disintegration constant is high, the range is also high, we know that the range depends upon energy therefore the radio active substances of large decay constants emit high energy alpha particles.

# Department of Physics
# ANNUAL REPORT 16-17

| Additional Input Gyroscope | G.chandrakala (I MPCs) | Department of Physics |
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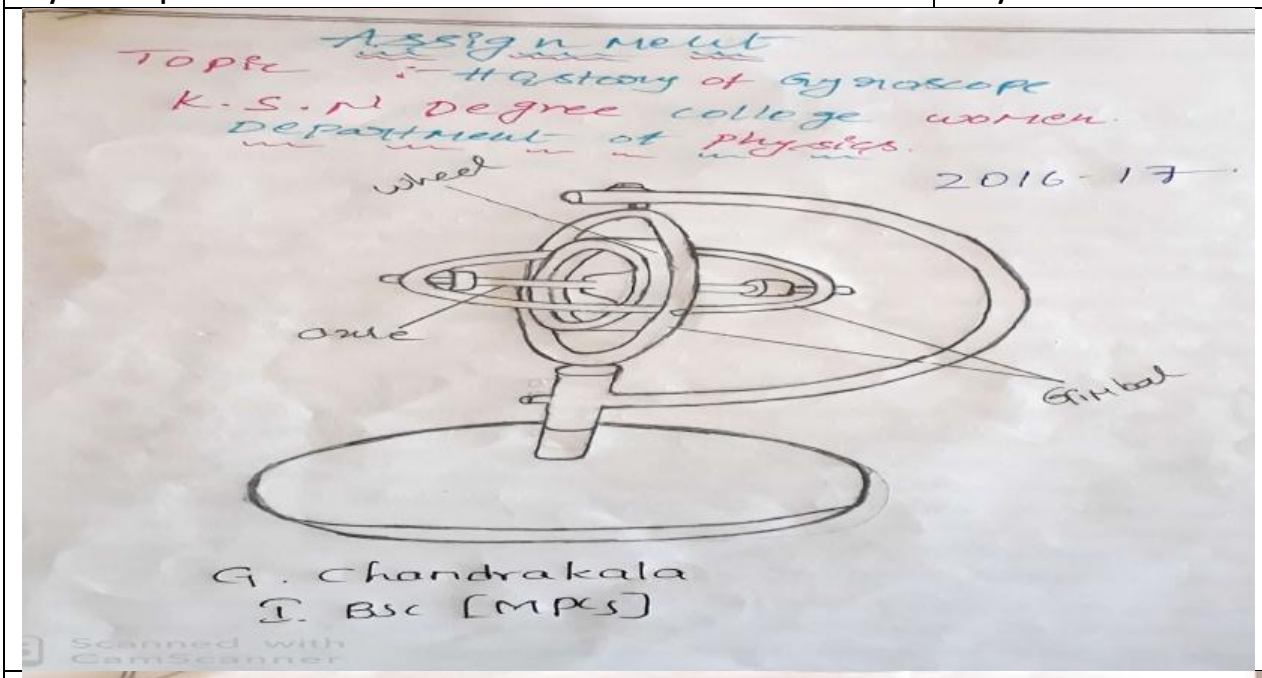


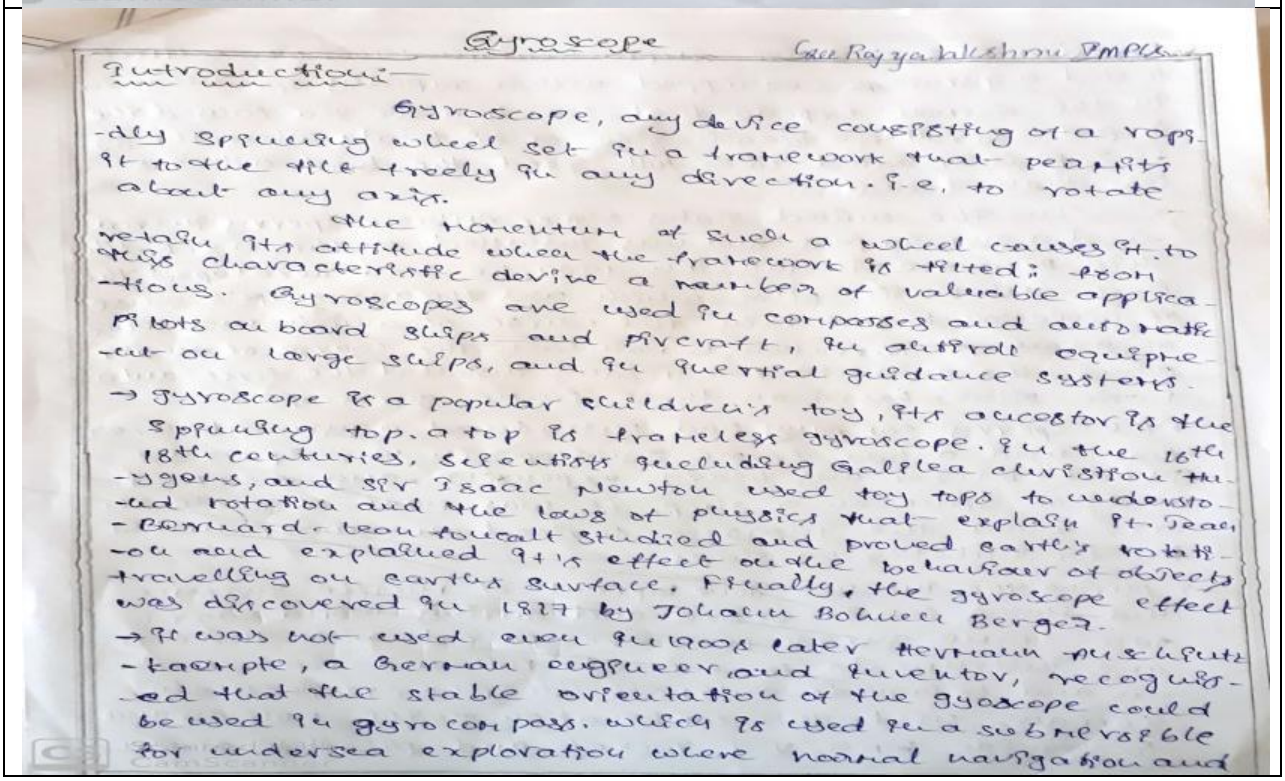

Gyroscope

Introduction:-

Gyroscope, any device consisting of a rapidly spinning wheel set in a framework that permits it to tilt in any direction, i.e. to rotate about any axis.

The momentum of such a wheel causes it to retain its attitude when the framework is tilted; from this characteristic device a number of valuable applications. Gyroscopes are used in compasses and automatic pilots on board ships and aircraft, in control equipment on large ships, and in inertial guidance systems.

→ Gyroscope is a popular children's toy, its ancestor is the spinning top. a top is frameless gyroscope. In the 16th 18th centuries, scientists including Galilea elucidation the gyros, and Sir Isaac Newton used toy tops to understand rotation and the laws of physics that explain it. Jean Bernard Leon foucalt studied and proved earth's rotation and explained it's effect on the behaviour of objects travelling on earths surface. Finally, the gyroscope effect was discovered in 1827 by Johann Bohnen Berger.

→ It was not used even 100 years later Hermann Anschütz-kaempfe, a German engineer and inventor, recognised that the stable orientation of the gyroscope could be used in gyrocompass, which is used in a submersible for undersea exploration where normal navigation and

# Department of Physics
# ANNUAL REPORT 16-17

| Additional Input V.Sushma(IMPCs) Gyroscope | Department of Physics |
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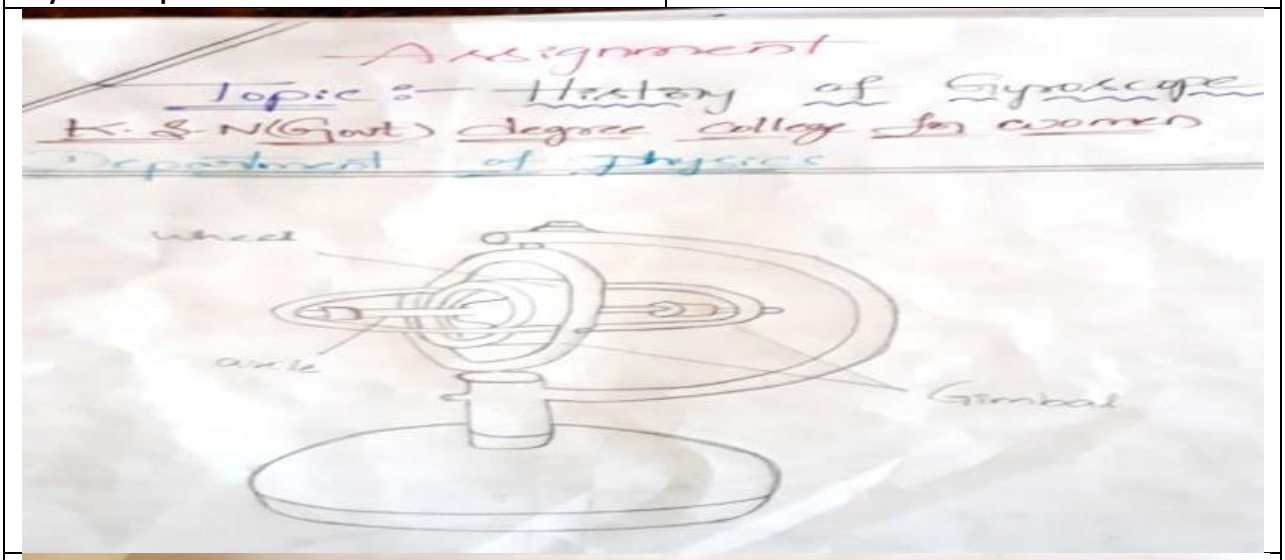


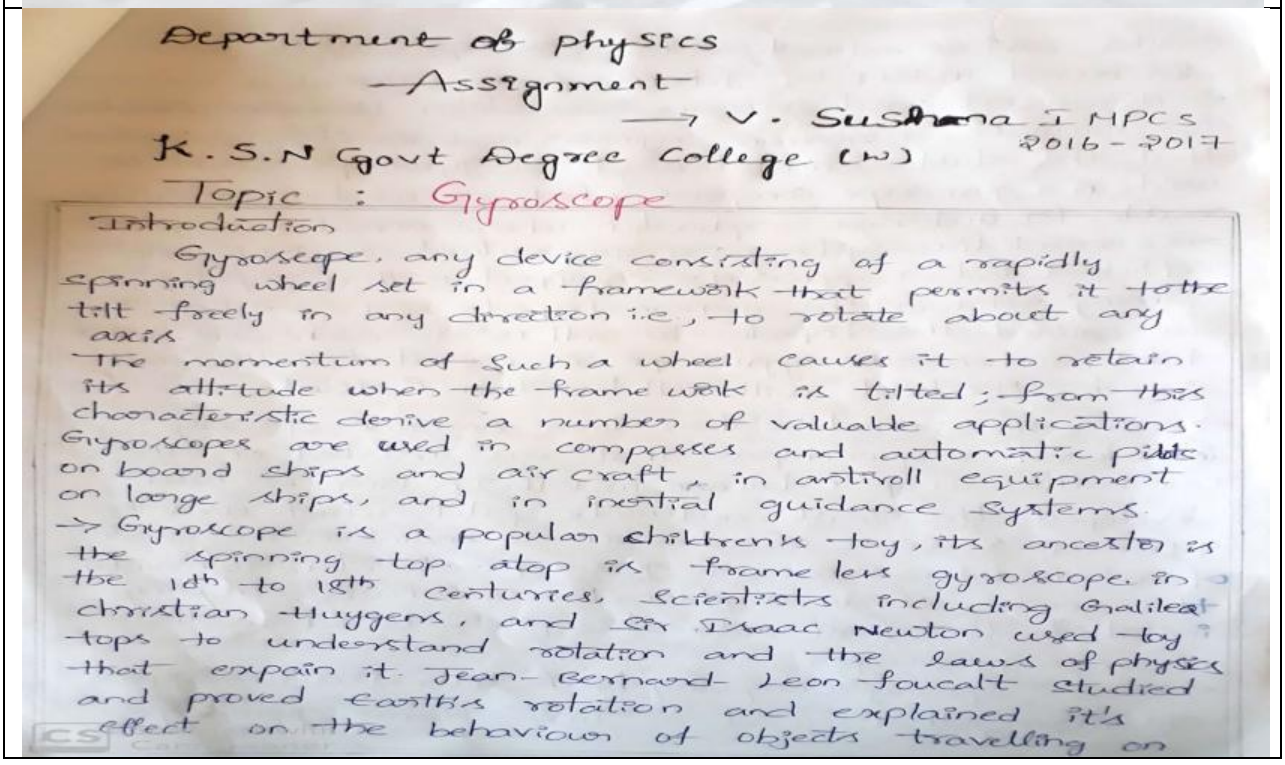

# Department of Physics
# ANNUAL REPORT 16-17

| Additional Input P.Lavanya(I MPCs) Gyroscope | Department of Physics |
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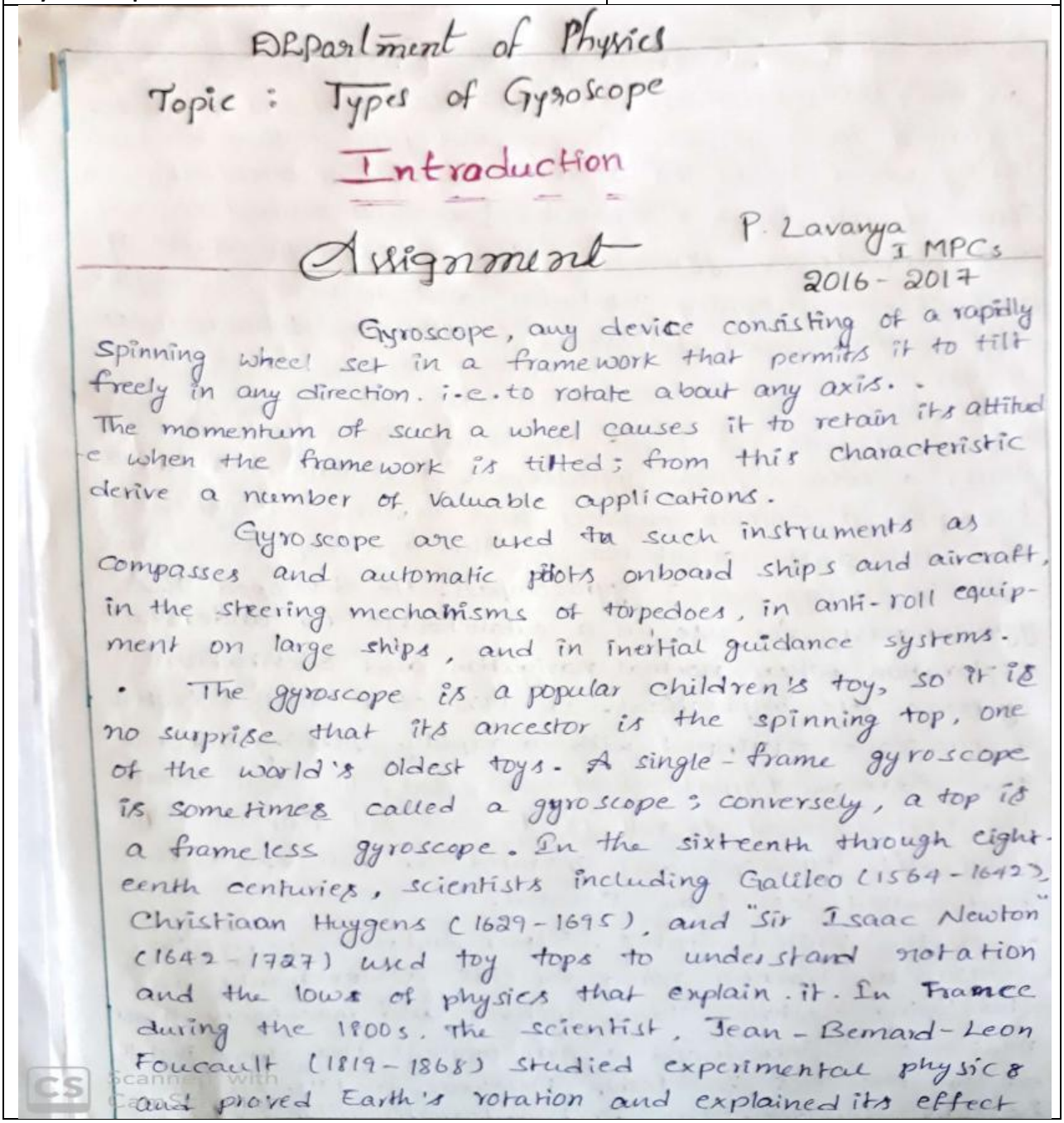

Department of Physics

Topic : Types of Gyroscope

Introduction

Assignment

P. Lavanya
I MPCs
2016 - 2017

Gyroscope, any device consisting of a rapidly spinning wheel set in a framework that permits it to tilt freely in any direction. i.e. to rotate about any axis. The momentum of such a wheel causes it to retain its attitude when the framework is tilted; from this characteristic derive a number of valuable applications.

Gyroscope are used in such instruments as compasses and automatic pilots onboard ships and aircraft, in the steering mechanisms of torpedoes, in anti-roll equipment on large ships, and in inertial guidance systems.

The gyroscope is a popular children's toy, so it is no surprise that its ancestor is the spinning top, one of the world's oldest toys. A single-frame gyroscope is sometimes called a gyroscope; conversely, a top is a frameless gyroscope. In the sixteenth through eighteenth centuries, scientists including Galileo (1564-1642), Christiaan Huygens (1629-1695), and "Sir Isaac Newton" (1642-1727) used toy tops to understand rotation and the laws of physics that explain it. In France during the 1800s, the scientist, Jean-Bernard-Leon Foucault (1819-1868) studied experimental physics and proved Earth's rotation and explained its effect

# Department of Physics
# ANNUAL REPORT 16-17

| Additional Input Gyroscope | V.Bhavani(I MPCs) | Department of Physics |
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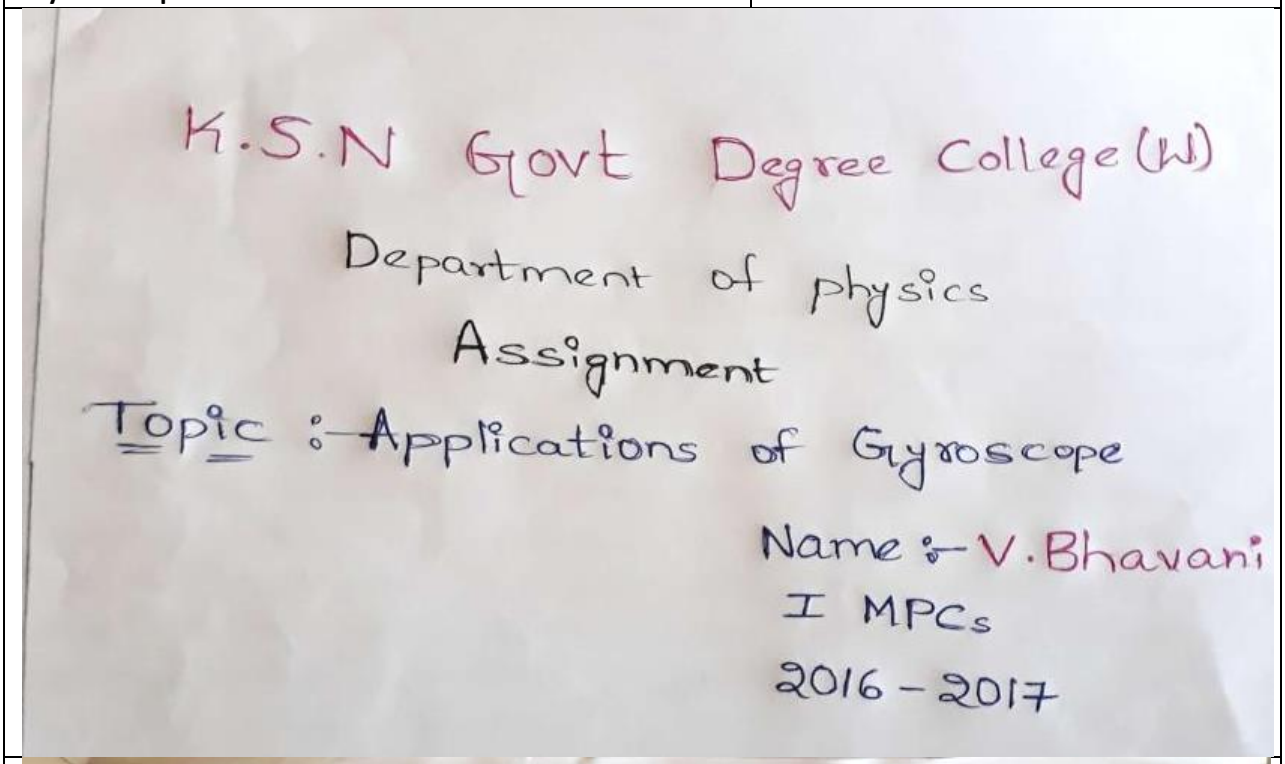


K.S.N Govt Degree College (W)

Department of physics

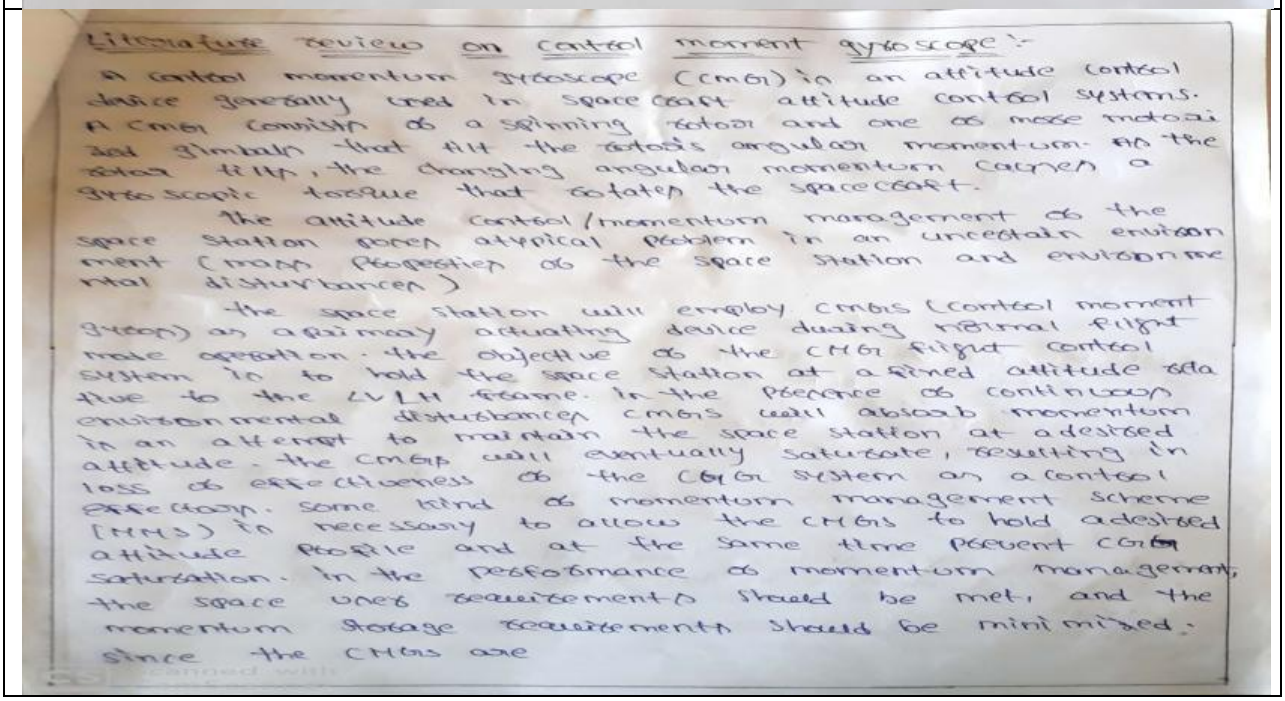
Assignment

Topic : Applications of Gyroscope

Name :- V.Bhavani

I MPCs

2016 - 2017



Literature review on control moment gyroscope :-

A control momentum gyroscope (CMG) is an attitude control device generally used in spacecraft attitude control systems. A CMG consists of a spinning rotor and one or more motorized gimbals that tilt the rotor's angular momentum. As the rotor tilts, the changing angular momentum causes a gyroscopic torque that rotates the spacecraft.

The attitude control/momentum management of the space station poses atypical problem in an uncertain environment (mass properties of the space station and environmental disturbances)

The space station will employ CMGs (control moment gyros) as a primary actuating device during normal flight mode operation. the objective of the CMG flight control system is to hold the space station at a fixed attitude with due to the LVLH frame. In the presence of continuous environmental disturbances CMGs will absorb momentum in an attempt to maintain the space station at a desired attitude. the CMGs will eventually saturate, resulting in loss of effectiveness of the CMG system as a control effector. some kind of momentum management scheme (MMS) is necessary to allow the CMGs to hold a desired attitude profile and at the same time prevent CMG saturation. In the performance of momentum management, the space user's requirements should be met, and the momentum storage requirements should be minimized. since the CMGs are

# Department of Physics
# ANNUAL REPORT 16-17

| Additional Input Gyroscope | C.Mounikadevi(IMPCs) | Department of Physics |
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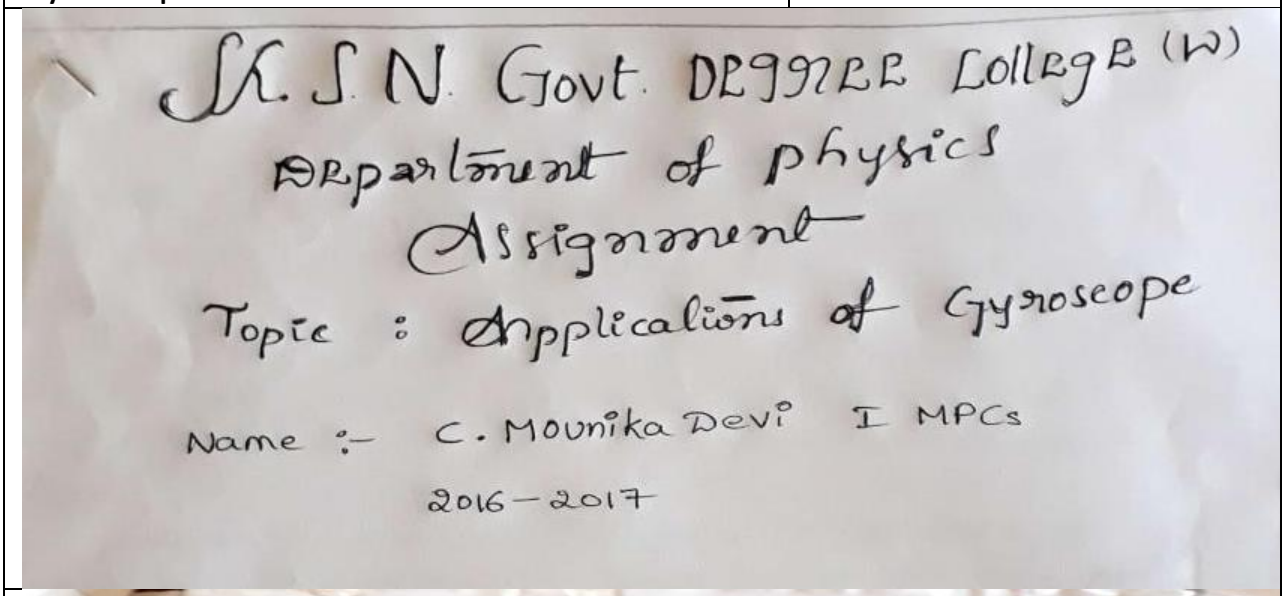


Sk. S N. Govt. DEGREE College (W)

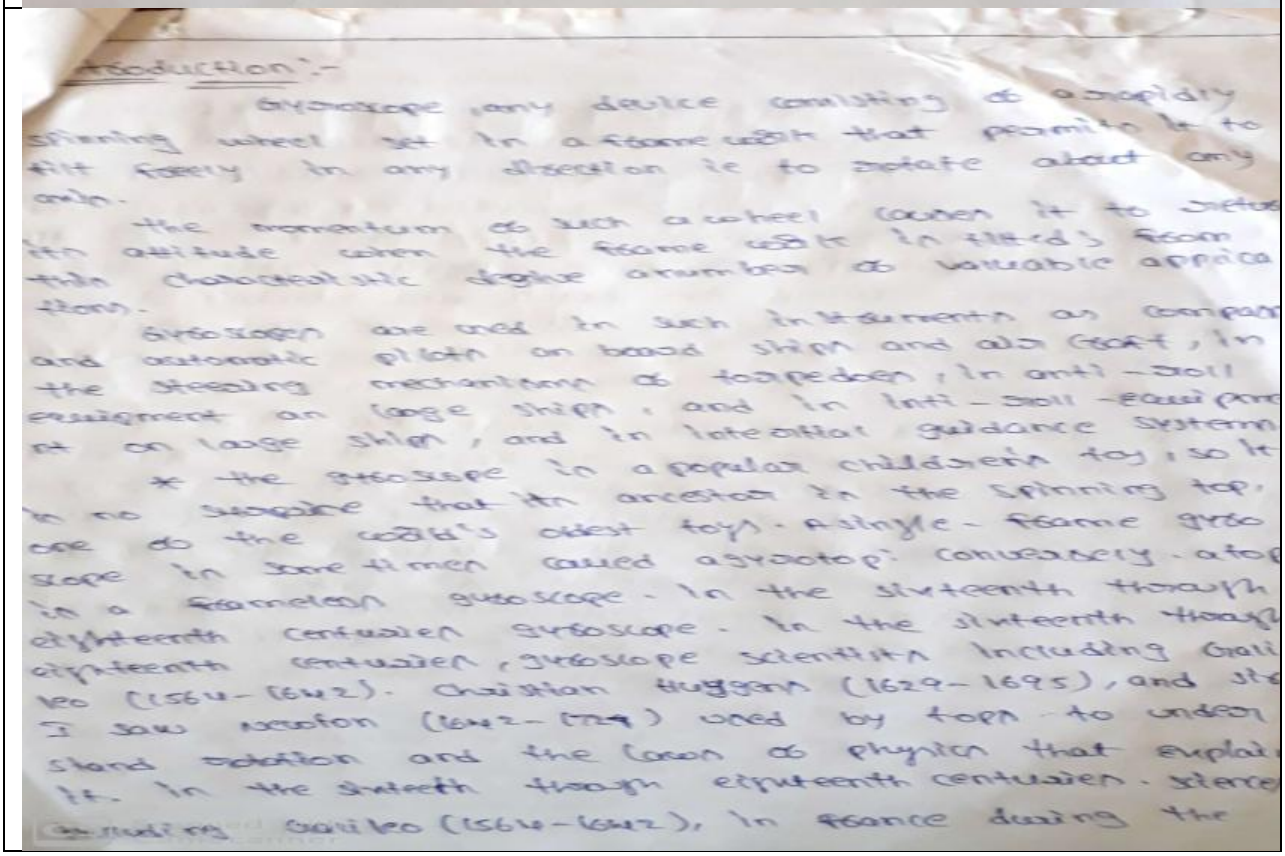
Department of physics

Assignment

Topic : Applications of Gyroscope

Name :- C. Mounika Devi I MPCs

2016-2017



Introduction:-

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