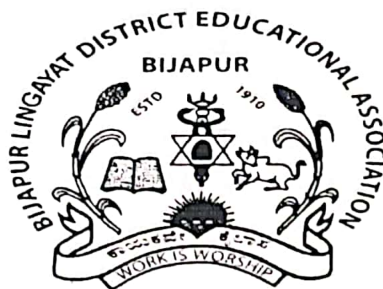


BLDE ASSOCIATION'S
S.B.ARTS AND K.C.P SCIENCE COLLEGE,
VIJAYAPUR



DEPARTMENT OF PHYSICS
ADVANCED LEARNERS SEMINAR REPORT
2023-24 (ODD SEMESTERS)



B. L. D. E. ASSOCIATION'S
S. B. ARTS AND K. C. P. SCIENCE COLLEGE
Int. Bangaramma Sajjan Campus, Shri B. M. Patil Road (Solapur Road), Vijayapur-586 103
Accredited with CGPA of 2.99 at 'B' Grade in 4th Cycle by NAAC
(Affiliated to Rani Channamma University, Belagavi)
Phone: (08352) 262770, Extn. 2223, 2224
Website: www.bldeashbkcp.ac.in E-mail: bldeashbkcp@gmail.com



Policy documentation for advanced learners

- ❖ Introduction
- ❖ Advanced learners
- ❖ Identification for advanced learners
- ❖ Activities for advanced learners
- ❖ Method of assessment



Introduction

Advanced learners

Advanced learners are those students who have more potential with the regard to critical, creative thinking and contextualizing and practical. They are hardworking, goal oriented, achieve high scores and can should higher level of academic responsibilities. They can be also molded in teaching learning activities.

Guidelines for identifying Advanced Learners (bright Students):

Advanced Learners are identified based on the first internal examinations those who secured greater than 80%.

Following Special activities are conducted for Advanced Learners:

1. Guiding for career planning.
2. Students were performed the seminar on the advanced topic.



B. L. D. E. ASSOCIATION'S
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Phone: (08352) 262770, Extn. 2223, 2224
Website: www.bldeasbkcp.ac.in E-mail: bldeasbkcp@gmail.com



Date: 08/01/2024

DEPARTMENT OF PHYSICS

NOTICE

The UG Department of Physics will be conducting seminar for the B.Sc I, III & V Semesters students (Advanced learners) of the Academic year 2023-24 (odd Semester) from 09/01/2024 to 3/02/2024.

HOD

Head
Department of Physics
S.B.Arts & K.C.P.Science College
Vijayapur-586103.

IQAC Coordinator

IQAC, Co-ordinator
S.B.Arts & K.C.P.Science College,
Vijayapur.

Principal,
S.B.Arts & K.C.P. Science College,
VIJAYAPUR.



List of Advanced Learners

Sl.No	Name of the student	Class	UUCMS No
1.	BHAGYASHRI INDI	B.Sc I	U15KM23S0028
2.	DANAMMA M BIDARI	B.Sc I	U15KM23S0071
3.	BHAGYASHREE M. BADIGER	B.Sc I	U15KM23S0088
4.	SAVITA MANTESH LAMANI	B.Sc I	U15KM23S0101
5.	MAHESH D MATHPATI	B.Sc I	U15KM23S0111
6.	SAKSHI S PATIL	B.Sc I	U15KM23S0112
7.	PRAGATI GADDEPPA METRI	B.Sc I	U15KM23S0128
8.	PRIYA PARASURAM MADAR	B.Sc I	U15KM23S0157
9.	VIDYASHREE S. K	B.Sc I	U15KM23S0158
10.	VAISHNAVI P KODABAGI	B.Sc I	U15KM23S0174
11.	AMBIKA J SANKH	B.Sc I	U15KM23S0191
12.	CHAITRA DONAJ	B.Sc I	U15KM23S0201
13.	BASAMMA PATIL	B.Sc I	U15KM23S0203
14.	RUKMINI DARVESHI	B.Sc I	U15KM23S0209
15.	SUDHARANI S METRI	B.Sc I	U15KM23S0222
16.	SAVITA D KADAKAL	B.Sc I	U15KM23S0224
17.	SHRADDHA S MARYANI	B.Sc I	U15KM23S0230
18.	SUCHITRA S KUMBAR	B.Sc I	U15KM23S0244
19.	SOUMYA S. LAKKANAGAON	B.Sc I	U15KM23S0250
20.	AMBIKA DUDAGI	B.Sc I	U15KM23S0252
21.	DARSHAN S MENDEGAR	B.Sc I	U15KM23S0257
22.	VACHANA	B.Sc I	U15KM23S0275
23.	SOIJANYA PRAKASH JYOTI	B.Sc I	U15KM23S0276
24.	GANGADHAR S ARAVATTU	B.Sc I	U15KM23S0297
25.	LAKSHMI BASTAWAD	B.Sc I	U15KM23S0305
26.	AKSHATA T BIRADAR	B.Sc I	U15KM23S0314
27.	GANGAMMA Y ASANGI	B.Sc I	U15KM23S0346
28.	POOJA NADAGOUDA	B.Sc I	U15KM23S0348
29.	AISHWARYA B. ASNGTHAL	B.Sc I	U15KM23S0349
30.	SANGEETA VADDODAGI	B.Sc I	U15KM23S0376
31.	MADHAVI ZALAKIKAR	B.Sc I	U15KM23S0384
32.	SHWETA	B.Sc III	U15KM22S0002
33.	RENUKA VITHAL MANNAGOL	B.Sc III	U15KM22S0010
34.	PRAGATI KANTIKAR	B.Sc III	U15KM22S0021

36.	CHETAN MUTTUR	B.Sc III	U15KM22S0034
37.	AISHWARYA HIEMATH	B.Sc III	U15KM22S0054
38.	MAHADEVI B PATIL	B.Sc III	U15KM22S0060
39.	NEELES B ELAVANAKI	B.Sc III	U15KM22S0064
40.	SHAILASHREE KANASHETTI	B.Sc III	U15KM22S0108
41.	PUSHPA R NAGATHANA	B.Sc III	U15KM22S0113
42.	ARSHAD PATEL PATIL	B.Sc III	U15KM22S0120
43.	SAHANA MALAPPAGOL	B.Sc III	U15KM22S0125
44.	BHAGYASHREE P JAMBRE	B.Sc III	U15KM22S0128
45.	ROOPA G PUJARI	B.Sc III	U15KM22S0131
46.	AKSHATA B BELLUNDAGI	B.Sc III	U15KM22S0145
47.	JAYASHREE	B.Sc III	U15KM22S0153
48.	ASHWINI S SANDIMANI	B.Sc III	U15KM22S0154
49.	SAVITRI NANDAGAON	B.Sc III	U15KM22S0160
50.	AKSHATA KOLI	B.Sc III	U15KM22S0174
51.	RIJWANASAMARIN	B.Sc III	U15KM22S0186
52.	BHAGAVANTRAY HOSAMANI	B.Sc III	U15KM22S0188
53.	ABDUL YADAGIRI	B.Sc III	U15KM22S0221
54.	AKSHATA ADAGALLA	B.Sc III	U15KM22S0257
55.	SWATI S BISANAL	B.Sc III	U15KM22S0259
56.	PREMA BAGALKOT	B.Sc III	U15JU22S0058
57.	RUCHITA PADASALAGI	B.Sc V	U15KM21S0007
58.	AISHWARYA S GHANURE	B.Sc V	U15KM21S0011
59.	LAXMI NARASINGH RAJPUT	B.Sc V	U15KM21S0014
60.	SABALE D LAGAMANNA	B.Sc V	U15KM21S0026
61.	AISHWARYA D GADAGI	B.Sc V	U15KM21S0027
62.	NIKITA BIRADAR	B.Sc V	U15KM21S0043
63.	SHRUTI JETTEPPA ALOOR	B.Sc V	U15KM21S0049
64.	MANJUNATH R ANKALAGI	B.Sc V	U15KM21S0053
65.	VIJAYALAXMI MANGANAVAR	B.Sc V	U15KM21S0074
66.	SIRINA SULTAN UMARJI	B.Sc V	U15KM21S0091
67.	BHUVANESHWARI AGASAR	B.Sc V	U15KM21S0097
68.	AKSHITA WALIKAR	B.Sc V	U15KM21S0099
69.	PRIYA SUNIL CHIKKANAVAR	B.Sc V	U15KM21S0112
70.	SHESHANK J YADAHALLI	B.Sc V	U15KM21S0113
71.	SATTIGERI PAVITRA RAMESH	B.Sc V	U15KM21S0117
72.	MALLIKARJUN S DYAMUGOLA	B.Sc V	U15KM21S0132
73.	SWAPNA R MUCHCHANDI	B.Sc V	U15KM21S0134
74.	AISHWARYA M ARAVATTI	B.Sc V	U15KM21S0149
75.	PRAGATI DAYANANDA PUJARI	B.Sc V	U15KM21S0151
76.	AKSHATHA HUNGUND	B.Sc V	U15KM21S0160
77.	PRAJWAL AIHOLE	B.Sc V	U15KM21S0163
78.	ANKITA VITHOBA GORANAL	B.Sc V	U15KM21S0166

79.	PREMA SIDAGOUDA PATIL	B.Sc V	U15KM2IS0177
80.	SARPARAJ	B.Sc V	U15KM2IS0185
81.	MAHAMADRAFIQ PINJAR	B.Sc V	U15KM2IS0188
82.	PRIYANKA	B.Sc V	U15KM2IS0189
83.	RAHUL SAHEBAGOUD PATIL	B.Sc V	U15KM2IS0195
84.	JYOTI BAGALI	B.Sc V	U15KM2IS0197
85.	NAVEEN BADIGER	B.Sc V	U15KM2IS0200
86.	JYOTI JIDDAGI	B.Sc V	U15KM2IS0201
87.	JYOTI RAMESH BIRADAR	B.Sc V	U15KM2IS0207
88.	SOUNDARYA TANGA	B.Sc V	U15KM2IS0210
89.	ASPAKALI K JAKATADAR	B.Sc V	U15KM2IS0224
90.	SHAFIYA RAMALI	B.Sc V	U15KM2IS0225
91.	SHAMEEM IQBAL PENDARI	B.Sc V	U15KM2IS0232
92.	SHREYA DENG	B.Sc V	U15KM2IS0240
93.	SHRUTI	B.Sc V	U15KM2IS0244
94.	SACHIN SHRIMANT RATHOD	B.Sc V	U15KM2IS0247
95.	MADIVALAPPA P BUDIHAL	B.Sc V	U15KM2IS0261
96.	RASHMI	B.Sc V	U15KM2IS0284
97.	APARNA R KANNUR	B.Sc V	U15KM2IS0299
98.	BHAGYASHREE HALAGUNAKI	B.Sc V	U15KM2IS0306
99.	RAJASHREE R UPPAR	B.Sc V	U15KM2IS0323
100.	BHAGYANIDHI BUDIHAL	B.Sc V	U15KM2IS0339
101.	BHAVYA MUDAKAPPA NAYAK	B.Sc V	U15KM2IS0353
102.	ASHWINI S ANJUTAGI	B.Sc V	U15KM2IS0354
103.	KAVYASHREE M KALADAGI	B.Sc V	U15KM2IS0362
104.	SPOORTI S SIDDAPUR	B.Sc V	U15KM2IS0372
105.	SHRUTI PUJARI	B.Sc V	U15KM2IS0384
106.	NAGAVENI HARIWAL	B.Sc V	U15KM2IS0389
107.	VIDYA SHREESHAIL BIRADAR	B.Sc V	U15KM2IS0396
108.	DANESHWARI M GUGGARI	B.Sc V	U15KM2IS0422
109.	LAXMI BASAPPA BIRADAR	B.Sc V	U15KM2IS0430
110.	AISHWARYA	B.Sc V	U15KM2IS0439
111.	SHIVANI BALASAB GHADAGE	B.Sc V	U15KM2IS0444
112.	MUBARAK M MULLA	B.Sc V	U15KM2IS0450
113.	LAXMI BHARAMACHI	B.Sc V	U15KM2IS0451
114.	NIRMALA DODDANINGAPPAGOL	B.Sc V	U15KM2IS0556
115.	NETRA KAKASAB PATIL	B.Sc V	U15KM2IS0578

[Signature]

Head
Department of Physics
S.B.Arts & K.C.P.Science College
Vijayapur-586103.

[Signature]

IQAC, Co-ordinator
S.B.Arts & K.C.P.Science College,
Vijayapur.

[Signature]

Principal,
S.B.Arts & K.C.P.Science College,
VIJAYAPUR.

B.L.D.E.ASSOCIATION'S
S. B. ARTS AND K. C. P. SCIENCE COLLEGE VIJAYAPUR
DEPARTMENT OF PHYSICS & ELECTRONICS

Class: B.Sc

Sem: V

Date: 1-09-2024

Subject: Physics-II

Seminar Attendance Sheet

Roll No	UUCMS No	Sign	Roll No	UUCMS No	Sign
01	U15KM2150567	<i>ABey</i>	29	U15KM2150387	<i>ABey</i>
02	U15KM2150036	<i>Beece</i>	30	U15KM2150360	<i>ABey</i>
03	U15KM2150284	<i>Rashin</i>	31	U15KM2150366	<i>ABey</i>
04	U15KM2150357	<i>ABey</i>	32	U15KM2150362	<i>ABey</i>
05	U15KM2150451	<i>ABey</i>	33	U15KM2150359	<i>ABey</i>
06	U15KM2150390	<i>ABey</i>	34	U15KM2150315	<i>ABey</i>
07	U15KM2150297	<i>ABey</i>	35	U15KM2150310	<i>ABey</i>
08	U15KM2150392	<i>ABey</i>	36	U15KM2150049	<i>ABey</i>
09	U15KM2150384	<i>ABey</i>	37	U15KM2150240	<i>ABey</i>
10	U15KM2150277	<i>ABey</i>	38	U15KM2150299	<i>ABey</i>
11	U15KM2150511	<i>ABey</i>	39	U15KM2150369	<i>ABey</i>
12	U15KM2150372	<i>ABey</i>	40	U15KM2150370	<i>ABey</i>
13	U15KM2150370	<i>ABey</i>	41	U15KM2150372	<i>ABey</i>
14	U15KM2150369	<i>ABey</i>	42	U15KM2150367	<i>ABey</i>
15	U15KM2150366	<i>ABey</i>	43	U15KM2150086	<i>ABey</i>
16	U15KM2150389	<i>ABey</i>	44	U15KM2150072	<i>ABey</i>
17	U15KM2150439	<i>ABey</i>	45	U15KM2150062	<i>ABey</i>
18	U15KM2150578	<i>ABey</i>	46	U15KM2150573	<i>ABey</i>
19	U15KM2150436	<i>ABey</i>	47	U15KM2150261	<i>ABey</i>
20	U15KM2150378	<i>ABey</i>	48	U15KM2150082	<i>ABey</i>
21	U15KM2150556	<i>ABey</i>	49	U15KM2150185	<i>ABey</i>
22	U15KM2150557	<i>ABey</i>	50	U15KM2150393	<i>ABey</i>
23	U15KM2150315	<i>ABey</i>	51	U15KM2150393	<i>ABey</i>
24	U15KM2150383	<i>ABey</i>	52	U15KM2150235	<i>ABey</i>
25	U15KM2150474	<i>ABey</i>	53	U15KM2150208	<i>ABey</i>
26	U15KM2150357	<i>ABey</i>	54	U15KM2150195	<i>ABey</i>
27	U15KM2150354	<i>ABey</i>	255	U15KM2150495	<i>ABey</i>
28	U15KM2150339	<i>ABey</i>	256	U15KM2150385	<i>ABey</i>

ABey

Head

Department of Physics
S.B.Arts & K.C.P.Science College
Vijayapur-586103;

IQAC, Co-ordinator

S.B.Arts & K.C.P.Science College,
Vijayapur.

ABey

Principal,
S.B.Arts & K.C.P. Sc. College
Vijayapur.



**B. L. D. E. ASSOCIATION'S
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Website: www.bldeasbkcp.ac.in E-mail: bldeasbkcp@gmail.com



Date: 8/02/2024

DEPARTMENT OF PHYSICS

Seminar Report

The Department of Physics conducted the seminars for Advanced Learners of B.Sc I, III, and V semesters. Students given seminars on the chapters covered in their syllabus, each student given 10 minutes for the topic which covers 8 minutes for seminar and 2 minutes for discussion.

The objective of conducting the seminars was to help the students that to improve their communication skills, knowledge and to reduce stage fear for the students.

HOD

**Head
Department of Physics
S.B.Arts & K.C.P.Science College
Vijayapur-586103.**

IQAC Coordinator

**IQAC, Co-ordinator
S.B.Arts & K.C.P.Science College,
Vijayapur.**

**Principal,
S.B.Arts & K.C.P. Science College,
VIJAYAPUR.**

NAME: Krupa. M. Biradar

CLASS : BSc Vth sem

UUCMS NO.: UISKM21S0001

Div : 'A'

Topic : Einstein's A and B
coefficients

=> Guided by - Anjana Madam

Laser Physics

Einstein's Co-efficients :-

Let N_1 and N_2 be the number of atoms per unit volume in energy states ① & ② with E_1 & E_2 energies respectively. Number of absorption transition per unit time per unit volume can be written as

$$N_1 B_{12} u(\nu) \text{ --- ①}$$

Where B_{12} is known as Einstein's B-coefficient of absorption radiation.

The number of spontaneous emission transition per unit time per unit volume can be written as

$$N_2 A_{21} \text{ --- ②}$$

Where A_{21} is known as Einstein's 'A' coefficient of spontaneous emission.

The number of stimulated emission transition per unit time per unit volume can be written as

$$N_2 B_{21} u(\nu) \text{ --- ③}$$

Where B_{21} - Einstein 'B' co-efficient of Stimulated emission,

At thermal equilibrium the number of upward transition ($1 \rightarrow 2$) should be equal to number of downward ($2 \rightarrow 1$) i.e.,

$$N_1 B_{12} u(\nu) = N_2 A_{21} + N_2 B_{21} u(\nu)$$

$$N_1 B_{12} u(\nu) - N_2 B_{21} u(\nu) = N_2 A_{21}$$

$$u(\nu) = \frac{N_2 A_{21}}{N_1 B_{12} - N_2 B_{21}} = \frac{A_{21} N_2}{B_{21} N_2 \left[\frac{B_{12} N_1}{B_{21} N_2} - 1 \right]}$$

$$u(\nu) = \frac{A_{21}}{B_{21} \left[\frac{B_{12} N_1}{B_{21} N_2} - 1 \right]} \quad \text{--- (4)}$$

The equilibrium distribution of atoms among different energy states at temperature 'T' is given by Boltzmann's law

Acc to which .

$$\frac{N_1}{N_2} = e^{(E_2 - E_1)/KT}$$

$$= e^{h\nu/KT}$$

where K - Boltzmann constant .

$\therefore$ eqⁿ (4) becomes

$$u(\nu) = \frac{A_{21}}{B_{21} \left[\frac{B_{12}}{B_{21}} \cdot e^{h\nu/KT} - 1 \right]}$$

$$u(\nu) = \frac{A_{21}}{B_{21} \left[\frac{1}{\frac{B_{12}}{B_{21}} e^{h\nu/KT} - 1} \right]} \quad \text{--- (5)}$$

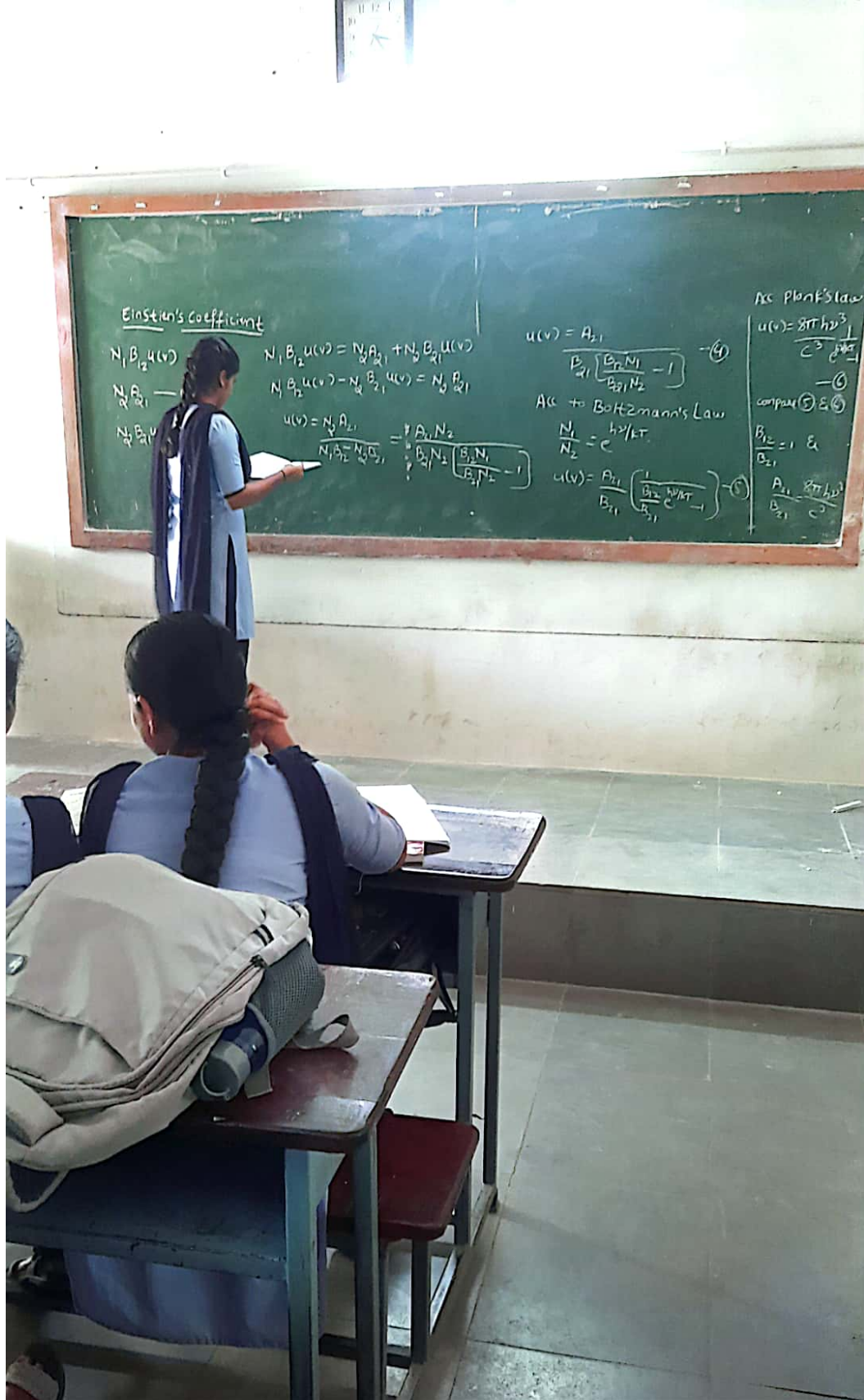
According to plank's radiation law the energy density of radiation at given temperature is given by

$$u(\nu) = \frac{8\pi h\nu^3}{c^3} \frac{1}{e^{h\nu/kT} - 1} \quad \text{--- (6)}$$

Hence comparing (5) & (6) we get

$$\Rightarrow \frac{B_{12}}{B_{21}} = 1, \quad \frac{A_{21}}{B_{21}} = \frac{8\pi h\nu^3}{c^3}$$

These results were obtained by Einstein's 1917 and that's why the co-efficient A_{21} , B_{12} and B_{21} are called as Einstein's A & B co-efficients.



Einstein's Coefficient

$$N_1 B_{12} u(\nu) = N_2 A_{21} + N_2 B_{21} u(\nu)$$

$$N_1 B_{12} u(\nu) - N_2 B_{21} u(\nu) = N_2 A_{21}$$

$$u(\nu) = \frac{N_2 A_{21}}{N_1 B_{12} - N_2 B_{21}} = \frac{A_{21} N_2}{B_{12} N_1 \left[\frac{B_{21} N_1}{B_{12} N_2} - 1 \right]}$$

$$u(\nu) = A_{21} \frac{B_{21} N_1}{B_{12} N_2 - 1} \quad (4)$$

Acc to Boltzmann's Law

$$\frac{N_1}{N_2} = e^{\frac{h\nu}{kT}}$$

$$u(\nu) = \frac{A_{21}}{B_{12}} \left(\frac{1}{\frac{B_{21}}{B_{12}} e^{\frac{h\nu}{kT}} - 1} \right) \quad (5)$$

Acc Planck's law

$$u(\nu) = \frac{8\pi h \nu^3}{c^3} \frac{1}{e^{\frac{h\nu}{kT}} - 1}$$

compare (5) & (6)

$$\frac{B_{12}}{B_{21}} = 1 \quad \&$$

$$\frac{A_{21}}{B_{12}} = \frac{8\pi h \nu^3}{c^3}$$

RPW6+33X, Bangaramma Sajjan Campus,
Vijayapura, Karnataka 586103, India

Latitude

16.845443°

Longitude

75.710435°

LOCAL 15:26:22

GMT 09:56:22

TUESDAY 01.09.2024

ALTITUDE 0 METER



GPS Map Camera

Vijayapura, Karnataka, India

Work Shop Bus Stop, SH 12, Shastri Nagar, Vijayapura, Karnataka 586101, India

Lat 16.831188°

Long 75.702505°

30/01/24 11:27 AM GMT +05:30

Google

BLDE ASSOCIATION'S
S.B.ARTS AND K.C.P SCIENCE COLLEGE,
VIJAYAPUR



DEPARTMENT OF PHYSICS
ADVANCED LEARNERS SEMINAR REPORT
2023-24 (EVEN SEMESTER)



**B. L. D. E. ASSOCIATION'S
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BLDE New Campus, Shri B. M. Patil Road , Vijayapur-586 103
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Policy documentation for advanced learners

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Introduction

Advanced learners

Advanced learners are those students who have more potential with the regard to critical, creative thinking and contextualizing and practical. They are hardworking, goal oriented, achieve high scores and can should higher level of academic responsibilities. They can be also molded in teaching learning activities.

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1. Guiding for career planning.
2. Students were performed the seminar on the advanced topic.



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Date: 16/07/2024

DEPARTMENT OF PHYSICS

NOTICE

The UG Department of Physics will be conducting seminar for the B.Sc II, IV, VI Semester students (Advanced learners) of the Academic year 2023-24(Even Semester) from 18/07/2024 to 31/07/2024

HOD

**Head
Department of Physics
S.B.Arts & K.C.P.Science College
Vijayapur-586103,**

IQAC Coordinator

**IQAC, Co-ordinator
S.B.Arts & K.C.P.Science College,
Vijayapur.**

Principal

**S.B.Arts & K.C.P. Science College,
VIJAYAPUR.**



List of Advanced Learners

Sl.No	Name of the student	Class	UUCMS No
1.	BHAGYASHRI INDI	B.Sc II	U15KM23S0028
2.	DANAMMA M BIDARI	B.Sc II	U15KM23S0071
3.	BHAGYASHREE M. BADIGER	B.Sc II	U15KM23S0088
4.	SAVITA MANTESH LAMANI	B.Sc II	U15KM23S0101
5.	VIDYASHREES.KORACHGAON	B.Sc II	U15KM23S0158
6.	VAISHNAVI P KODABAGI	B.Sc II	U15KM23S0174
7.	AMBIKA J SANKH	B.Sc II	U15KM23S0191
8.	SAVITRI A GHANTE	B.Sc II	U15KM23S0193
9.	PALLAVI JUMANAL	B.Sc II	U15KM23S0205
10.	RUKMINI DARVESHI	B.Sc II	U15KM23S0209
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12.	SAVITA D KADAKAL	B.Sc II	U15KM23S0224
13.	SHRADDHA S MARYANI	B.Sc II	U15KM23S0230
14.	SOUMYA S. LAKKANAGAON	B.Sc II	U15KM23S0250
15.	AMBIKA DUDAGI	B.Sc II	U15KM23S0252
16.	DARSHAN S MENDEGAR	B.Sc II	U15KM23S0257
17.	VACHANA	B.Sc II	U15KM23S0275
18.	SOUJANYA PRAKASH JYOTI	B.Sc II	U15KM23S0276
19.	AKSHATA T BIRADAR	B.Sc II	U15KM23S0314
20.	PRIYANKA G S	B.Sc II	U15KM23S0356
21.	SOUMYA JOGUR	B.Sc II	U15KM23S0372
22.	TABASSUM BENNI	B.Sc II	U15KM23S0379
23.	MADHAVI ZALAKIKAR	B.Sc II	U15KM23S0384
24.	SHWETA	B.Sc IV	U15KM22S0002
25.	ANKITA S MIRJI	B.Sc IV	U15KM22S0018
26.	PRAGATI KANTIKAR	B.Sc IV	U15KM22S0021
27.	MADHUMATI IRAPPA KALAGOND	B.Sc IV	U15KM22S0024
28.	AISHWARYA HIREMATH	B.Sc IV	U15KM22S0054
29.	SHAILASHREE KANASHETTI	B.Sc IV	U15KM22S0108
30.	PUSHPA R NAGATHANA	B.Sc IV	U15KM22S0113
31.	ARSHAD PATEL PATIL	B.Sc IV	U15KM22S0120
32.	SAHANA MALAPPAGOL	B.Sc IV	U15KM22S0125
33.	BHAGYASHREE P JAMBRE	B.Sc IV	U15KM22S0128

34.	ROOPA G PUJARI	B.Sc IV	U15KM22S0131
35.	AKSHATA B BELLUNDAGI	B.Sc IV	U15KM22S0145
36.	JAYASHREE	B.Sc IV	U15KM22S0153
37.	ASHWINI S SANDIMANI	B.Sc IV	U15KM22S0154
38.	SHWETA HUNASAGI	B.Sc IV	U15KM22S0158
39.	BHOOMIKA KONAGULI	B.Sc IV	U15KM22S0180
40.	RIJWANASAMARIN	B.Sc IV	U15KM22S0186
41.	APOORVA S SANGA	B.Sc IV	U15KM22S0189
42.	ANJALI PATIL	B.Sc IV	U15KM22S0213
43.	ABDUL YADAGIRI	B.Sc IV	U15KM22S0221
44.	AKSHATA ADAGALLA	B.Sc IV	U15KM22S0257
45.	RAKSHITA S TAVARAKHED	B.Sc IV	U15KM22S0276
46.	PREMA BAGALKOT	B.Sc IV	U15JU22S0058
47.	KRUPA BIRADAR	B.Sc VI	U15KM21S0001
48.	AISHWARYA S GHANURE	B.Sc VI	U15KM21S0011
49.	SABALE D LAGAMANNA	B.Sc VI	U15KM21S0026
50.	NIKITA BIRADAR	B.Sc VI	U15KM21S0043
51.	VIJAYALAXMI MANGANNAVAR	B.Sc VI	U15KM21S0074
52.	PRIYANKA S GALAVE	B.Sc VI	U15KM21S0086
53.	BHUVANESHWARI AGASAR	B.Sc VI	U15KM21S0097
54.	PRIYA SUNIL CHIKKANNAVAR	B.Sc VI	U15KM21S0112
55.	MADHUPRIYA	B.Sc VI	U15KM21S0150
56.	AKSHATHA HUNGUND	B.Sc VI	U15KM21S0160
57.	PRAJWAL AIHOLE	B.Sc VI	U15KM21S0163
58.	ANKITA VITHOBA GORANAL	B.Sc VI	U15KM21S0166
59.	AISHWARYA UMARANI	B.Sc VI	U15KM21S0173
60.	PREMA SIDAGOUDA PATIL	B.Sc VI	U15KM21S0177
61.	MAHAMADRAFIQ PINJAR	B.Sc VI	U15KM21S0188
62.	PRIYANKA	B.Sc VI	U15KM21S0189
63.	RAHUL SAHEBAGOUD PATIL	B.Sc VI	U15KM21S0195
64.	JYOTI BAGALI	B.Sc VI	U15KM21S0197
65.	NAVEEN BADIGER	B.Sc VI	U15KM21S0200
66.	JYOTI JIDDAGI	B.Sc VI	U15KM21S0201
67.	JYOTI RAMESH BIRADAR	B.Sc VI	U15KM21S0207
68.	SOUNDARYA TANGA	B.Sc VI	U15KM21S0210
69.	ASPAKALI K JAKATADAR	B.Sc VI	U15KM21S0224
70.	SHAFIYA RAMALI	B.Sc VI	U15KM21S0225
71.	SHAMEEM IQBAL PENDARI	B.Sc VI	U15KM21S0232
72.	SHREYA DENGII	B.Sc VI	U15KM21S0240
73.	SHRUTI	B.Sc VI	U15KM21S0244
74.	SACHIN SHRIMANT RATHOD	B.Sc VI	U15KM21S0247

75.	MADIVALAPPA P BUDIHAL	B.Sc VI	U15KM21S0261
76.	RASHMI	B.Sc VI	U15KM21S0284
77.	APARNA R KANNUR	B.Sc VI	U15KM21S0299
78.	BHAGYASHREE HALAGUNAKI	B.Sc VI	U15KM21S0306
79.	RAJASHREE R UPPAR	B.Sc VI	U15KM21S0323
80.	BHAGYANIDHI BUDIHAL	B.Sc VI	U15KM21S0339
81.	ASHWINI S ANJUTAGI	B.Sc VI	U15KM21S0354
82.	KAVYASHREE M KALADAGI	B.Sc VI	U15KM21S0362
83.	SPOORTI S SIDDAPUR	B.Sc VI	U15KM21S0372
84.	SHRUTI PUJARI	B.Sc VI	U15KM21S0384
85.	NAGAVENI HARIWAL	B.Sc VI	U15KM21S0389
86.	VIDYA SHREESHAIL BIRADAR	B.Sc VI	U15KM21S0396
87.	DANESHWARI M GUGGARI	B.Sc VI	U15KM21S0422
88.	LAXMI BASAPPA BIRADAR	B.Sc VI	U15KM21S0430
89.	AISHWARYA	B.Sc VI	U15KM21S0439
90.	ANANYA M BIRADAR	B.Sc VI	U15KM21S0441
91.	SHIVANI BALASAB GHADAGE	B.Sc VI	U15KM21S0444
92.	LAXMI BHARAMACHI	B.Sc VI	U15KM21S0451
93.	PRIYANKA KSHIRSAGAR	B.Sc VI	U15KM21S0460
94.	LOHIT WALIKAR	B.Sc VI	U15KM21S0469
95.	KAVYA UMADI	B.Sc VI	U15KM21S0501
96.	BHAGYASHREE JATTI	B.Sc VI	U15KM21S0509
97.	VAISHNAVI ANGADI	B.Sc VI	U15KM21S0511
98.	MEGHA NATIKAR	B.Sc VI	U15KM21S0514
99.	NIRMALA DODDANINGAPPAGOL	B.Sc VI	U15KM21S0556
100.	GURUDARSHAN SAKRI	B.Sc VI	U15KM21S0569



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S. B. ARTS AND K. C. P. SCIENCE COLLEGE VIJAYAPUR
DEPARTMENT OF PHYSICS

Class: B.Sc
SEM: IV Sem

Date: 31/07/20
Subject: Physics

Seminar Attendance Sheet

Sl. No.	UUCMS No.	Sign	Sl. No.	UUCMS No.	Sign
01.	U15KM22S0145	Abulunday	31)	U15JU22S0058	Perulthot
02.	U15KM22S0213	Abulunday	32)	U15KM22S0186	Perulthot
03.	U15KM22S0097	Abulunday	33)	U15KM22S0257	Perulthot
04.	U15KM22S0029	A.K.Koli	34)	U15KM22S0070	Perulthot
05.	U15KM22S0131	Abulunday	35)	U15KM22S0120	Perulthot
06.	U15KM22S0136	Abulunday	36)	U15KM22S0267	Perulthot
07.	U15KM22S0129	Abulunday	37)	U15KM22S0034	Perulthot
08)	U15KM22S0276	Perulthot	38)	U15KM22S0245	Perulthot
09)	U15KM22S0165	Perulthot	39)	U15KM22S0234	Perulthot
10)	U15KM22S0189	Perulthot	40)	U15KM22S0221	Perulthot
11)	U15KM22S0197	Perulthot	41)	U15KM22S0033	Perulthot
12)	U15KM22S0024	Perulthot	42)	U15KM22S0064	Perulthot
13)	U15KM22S0158	Perulthot	43)	U15KM22S0246	Perulthot
14)	U15KM22S0174	Perulthot	44)	U15KM22S0243	Perulthot
15)	U15KM22S0040	Perulthot	45)	U15KM22S0163	Perulthot
16)	U15KM22S0294	Perulthot	46)	U15KM22S0249	Perulthot
17)	U15KM22S0239	Perulthot	47)	U15KM22S0209	Perulthot
18)	U15KM22S0305	Perulthot	48)	U15KM22S0227	Perulthot
19)	U15KM22S0213	Perulthot	49)	U15KM22S0253	Perulthot
20)	U15KM22S0259	Perulthot	50)	U15KM22S0265	Perulthot
21)	U15KM22S0051	Perulthot	51)	U15KM22S0204	Perulthot
22)	U15KM22S0054	Perulthot	52)	U15KM22S0006	Perulthot
23)	U15KM22S0021	Perulthot	53)	U15KM22S0252	Perulthot
24)	U15KM22S0030	Perulthot	54)	U15KM22S0188	Perulthot
25)	U15KM22S0164	Perulthot			
26)	U15KM22S0291	Perulthot			
27)	U15KM22S0154	Perulthot			
28)	U15KM22S0128	Perulthot			
29)	U15KM22S0125	Perulthot			
30)	U15KM22S0180	Perulthot			

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(Affiliated to Rani Channamma University, Belagavi)
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Date: 02/08/2024

Seminar Report

The Department of Physics conducted the seminars for Advance Learners of B.Sc II, IV, and VI semester. Students given seminars on the chapters covered in their syllabus, each student given 10 minutes for the topic which covers 8 minutes for seminar and 2 minutes for discussion.

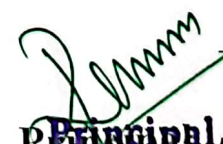
The objective of conducting the seminars was to help the students that to improve their communication skills, knowledge and to reduce stage fear for the students.


HOD

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**S B ARTS AND
KCP SCIENCE
COLLEGE
VIJAYAPUR**

NAME: ABDUL YADAGIRI

CLASS: Bsc IV

SUB: PHYSICS

ROLL NO: 66

UUCMS No: U15K M2250221

1] Maxwell's thermodynamic relation:

$\Rightarrow$ From the 1st law and 2nd law of thermodynamics Maxwell was able to derive four relations those are called Maxwell's thermodynamics relations.

$\Rightarrow$ The state of given system can be specified by four variables pressure (p), volume (v), temperature (T) and Entropy (S).

$\Rightarrow$ From the first law of thermodynamics

$$dQ = du + dw$$

$$dQ = du + p dv$$

$$du = dQ - p dv$$

$\Rightarrow$ From the second law of thermodynamics

$$dQ = T ds$$

then above equation becomes

$$du = T ds - p dv \rightarrow \textcircled{1}$$

$\Rightarrow$ Consider u , s and v be are functions of two independent variables x and y .

$$du = \left[\frac{\partial u}{\partial x} \right]_y dx + \left[\frac{\partial u}{\partial y} \right]_x dy, \quad ds = \left[\frac{\partial s}{\partial x} \right]_y dx + \left[\frac{\partial s}{\partial y} \right]_x dy$$

$$dv = \left[\frac{\partial v}{\partial x} \right]_y dx + \left[\frac{\partial v}{\partial y} \right]_x dy$$

$\Rightarrow$ substitute these values in equation (1)

$$\left[\frac{\partial u}{\partial x}\right]_y dx + \left[\frac{\partial u}{\partial y}\right]_x dy = T \left[\left[\frac{\partial s}{\partial x}\right]_y dx + \left[\frac{\partial s}{\partial y}\right]_x dy\right] - P \left[\left[\frac{\partial v}{\partial x}\right]_y dx + \left[\frac{\partial v}{\partial y}\right]_x dy\right]$$

$$\left[\frac{\partial u}{\partial x}\right]_y dx + \left[\frac{\partial u}{\partial y}\right]_x dy = \left[T \left[\frac{\partial s}{\partial x}\right]_y - P \left[\frac{\partial v}{\partial x}\right]_y\right] dx + \left[T \left[\frac{\partial s}{\partial y}\right]_x - P \left[\frac{\partial v}{\partial y}\right]_x\right] dy$$

$\Rightarrow$ comparing the coefficients of dx and dy , we get

$$\left[\frac{\partial u}{\partial x}\right]_y = T \left[\frac{\partial s}{\partial x}\right]_y - P \left[\frac{\partial v}{\partial x}\right]_y \rightarrow \textcircled{2}$$

$$\left[\frac{\partial u}{\partial y}\right]_x = T \left[\frac{\partial s}{\partial y}\right]_x - P \left[\frac{\partial v}{\partial y}\right]_x \rightarrow \textcircled{3}$$

$\Rightarrow$ differentiating equation $\textcircled{2}$ w.r.t 'y' and $\textcircled{3}$ w.r.t 'x'

$$\frac{\partial^2 u}{\partial y \partial x} = \left[\frac{\partial T}{\partial y}\right]_x \cdot \left[\frac{\partial s}{\partial x}\right]_y + T \left[\frac{\partial^2 s}{\partial y \partial x}\right] - \left[\frac{\partial P}{\partial y}\right]_x \cdot \left[\frac{\partial v}{\partial x}\right]_y - P \frac{\partial^2 v}{\partial y \partial x}$$

$$\left[\frac{\partial^2 u}{\partial x \partial y}\right] = \left[\frac{\partial T}{\partial x}\right]_y \cdot \left[\frac{\partial s}{\partial y}\right]_x + T \left[\frac{\partial^2 s}{\partial x \partial y}\right] - \left[\frac{\partial P}{\partial x}\right]_y \cdot \left[\frac{\partial v}{\partial y}\right]_x - P \frac{\partial^2 v}{\partial x \partial y}$$

$\Rightarrow$ since du is perfect differentiation

$$\frac{\partial^2 u}{\partial x \partial y} = \frac{\partial^2 u}{\partial y \partial x}$$

$\Rightarrow$ similarly for ∂T and ∂v

$$\frac{\partial^2 T}{\partial y \partial x} = \frac{\partial^2 T}{\partial x \partial y} \quad \text{and} \quad \frac{\partial^2 v}{\partial y \partial x} = \frac{\partial^2 v}{\partial x \partial y}$$

⇒ then above equations becomes equal to each other

$$\left[\frac{\partial T}{\partial y} \right]_x \cdot \left[\frac{\partial s}{\partial x} \right]_y + T \left[\frac{\partial^2 s}{\partial y \partial x} \right] - \left[\frac{\partial p}{\partial y} \right]_x \cdot \left[\frac{\partial v}{\partial x} \right]_y - p \frac{\partial^2 v}{\partial y \partial x}$$

$$= \left[\frac{\partial T}{\partial x} \right]_y \cdot \left[\frac{\partial s}{\partial y} \right]_x + T \left[\frac{\partial^2 s}{\partial x \partial y} \right] - \left[\frac{\partial p}{\partial x} \right]_y \cdot \left[\frac{\partial v}{\partial y} \right]_x - p \frac{\partial^2 v}{\partial x \partial y} \rightarrow (4)$$

then equation (4) becomes

$$\Rightarrow \left[\frac{\partial T}{\partial y} \right]_x \cdot \left[\frac{\partial s}{\partial x} \right]_y + T \left[\frac{\partial^2 s}{\partial x \partial y} \right] - \left[\frac{\partial p}{\partial y} \right]_x \cdot \left[\frac{\partial v}{\partial x} \right]_y - p \frac{\partial^2 v}{\partial y \partial x}$$

$$= \left[\frac{\partial T}{\partial x} \right]_y \cdot \left[\frac{\partial s}{\partial y} \right]_x + T \left[\frac{\partial^2 s}{\partial x \partial y} \right] - \left[\frac{\partial p}{\partial x} \right]_y \cdot \left[\frac{\partial v}{\partial y} \right]_x - p \frac{\partial^2 v}{\partial x \partial y}$$

$$\Rightarrow \left[\frac{\partial T}{\partial y} \right]_x \cdot \left[\frac{\partial s}{\partial x} \right]_y - \left[\frac{\partial p}{\partial y} \right]_x \cdot \left[\frac{\partial v}{\partial x} \right]_y = \left[\frac{\partial T}{\partial x} \right]_y \cdot \left[\frac{\partial s}{\partial y} \right]_x - \left[\frac{\partial p}{\partial x} \right]_y \cdot \left[\frac{\partial v}{\partial y} \right]_x \rightarrow (5)$$

⇒ Equation (5) is the general equation for Maxwell's thermodynamics relations.

⇒ In case of independent variable x and y any two of the four variables s, T, p and v can be substituted so that, one mechanical variable (p or v) and one thermal variable (s or T)

$$\Rightarrow \begin{matrix} (s, v) & (T, v) & (s, p) & (T, p) \\ (x, y) & (x, y) & (x, y) & (x, y) \end{matrix}$$

i) First Maxwell's thermodynamic relation:

$\Rightarrow [S, V]$ here $x = S, y = V$

$$\frac{\partial S}{\partial x} = 1, \quad \frac{\partial V}{\partial y} = 1$$

$$\frac{\partial S}{\partial y} = 0, \quad \frac{\partial V}{\partial x} = 0$$

$\Rightarrow$ substituting these value in equation (5)

$$\left[\frac{\partial T}{\partial y} \right]_x (1) - \left[\frac{\partial p}{\partial y} \right]_x (0) = \left[\frac{\partial T}{\partial x} \right]_y (0) - \left[\frac{\partial p}{\partial x} \right]_y (1)$$

$$\left[\frac{\partial T}{\partial y} \right]_x = - \left[\frac{\partial p}{\partial x} \right]_y$$

$$x = S, y = V$$

$$\left[\frac{\partial T}{\partial V} \right]_S = - \left[\frac{\partial p}{\partial S} \right]_V \rightarrow (6)$$

Equation (6) is the first Maxwell's thermodynamic relation.

ii) Second Maxwell's thermodynamic relation:

$\Rightarrow [T, V]$ here $x = T, y = V$

$$\frac{\partial T}{\partial x} = 1 \text{ and } \frac{\partial T}{\partial y} = 0, \quad \frac{\partial V}{\partial y} = 1, \quad \frac{\partial V}{\partial x} = 0$$

then equation (5) becomes

$$\Rightarrow \left[\frac{\partial s}{\partial x} \right]_y (0) - \left[\frac{\partial p}{\partial y} \right]_x (0) = \left[\frac{\partial s}{\partial y} \right]_x (1) - \left[\frac{\partial p}{\partial x} \right]_y (1)$$

$$\left[\frac{\partial s}{\partial y} \right]_x = \left[\frac{\partial p}{\partial x} \right]_y$$

$$x=T \text{ and } y=V$$

$$\Rightarrow \left[\frac{\partial s}{\partial V} \right]_T = \left[\frac{\partial p}{\partial T} \right]_V \rightarrow (7)$$

$\Rightarrow$ Equation (7) is Maxwell's 2nd relation

iii) Third Maxwell's thermodynamic relation:

$$\Rightarrow [s, p] \Rightarrow x=s \text{ and } y=p$$

$$\frac{\partial s}{\partial x} = 1 \quad \frac{\partial p}{\partial y} = 1$$

$$\frac{\partial s}{\partial y} = 0 \quad \frac{\partial p}{\partial x} = 0$$

$$\Rightarrow \left[\frac{\partial T}{\partial y} \right]_x (1) - \left[\frac{\partial v}{\partial x} \right]_y (1) = \left[\frac{\partial T}{\partial x} \right]_y (0) - \left[\frac{\partial v}{\partial y} \right]_x (0)$$

$$\left[\frac{\partial T}{\partial y} \right]_x = \left[\frac{\partial v}{\partial x} \right]_y \quad \text{here } x=s, y=p$$

$$\Rightarrow \left[\frac{\partial T}{\partial p} \right]_s = \left[\frac{\partial v}{\partial s} \right]_p \rightarrow (8)$$

$\Rightarrow$ Equation (8) is Maxwell's 3rd relation.

(iv) Fourth Maxwell's thermodynamic relation :

$\Rightarrow [T, p] \Rightarrow$ here $x=T$ and $y=p$

$$\frac{\partial T}{\partial x} = 1 \quad \frac{\partial p}{\partial y} = 1$$

$$\frac{\partial T}{\partial y} = 0 \quad \frac{\partial p}{\partial x} = 0$$

$$\Rightarrow \left[\frac{\partial S}{\partial x} \right]_y^{(1)} - \left[\frac{\partial v}{\partial x} \right]_y^{(1)} = \left[\frac{\partial S}{\partial y} \right]_x^{(1)} - \left[\frac{\partial v}{\partial y} \right]_x^{(1)}$$

$$\left[\frac{\partial S}{\partial y} \right]_x = - \left[\frac{\partial v}{\partial x} \right]_y$$

Here $x=T$ and $y=p$

$$\Rightarrow \left[\frac{\partial S}{\partial p} \right]_T = - \left[\frac{\partial v}{\partial T} \right]_p \rightarrow (9)$$

$\Rightarrow$ Equation (9) is Maxwell's fourth thermodynamic relation.

* * *

Maxwell's thermodynamic relations:-

From 1st law

$$dq = du + dw$$

$$dq = du + PdV$$

$$du = dq - PdV$$

From 2nd law

$$ds = \frac{dq}{T}$$

$$dq = Tds$$

$$du = Tds - PdV \quad (1)$$

x, y

$$du = \left(\frac{\partial u}{\partial x}\right)_y dx + \left(\frac{\partial u}{\partial y}\right)_x dy$$

$$ds = \left(\frac{\partial s}{\partial x}\right)_y dx + \left(\frac{\partial s}{\partial y}\right)_x dy$$

$$dv = \left(\frac{\partial v}{\partial x}\right)_y dx + \left(\frac{\partial v}{\partial y}\right)_x dy$$

$$\left(\frac{\partial u}{\partial x}\right)_y dx + \left(\frac{\partial u}{\partial y}\right)_x dy = T \left[\left(\frac{\partial s}{\partial x}\right)_y dx + \left(\frac{\partial s}{\partial y}\right)_x dy \right] - P \left[\left(\frac{\partial v}{\partial x}\right)_y dx + \left(\frac{\partial v}{\partial y}\right)_x dy \right]$$

$$= \left[T \left(\frac{\partial s}{\partial x}\right)_y - P \left(\frac{\partial v}{\partial x}\right)_y \right] dx + \left[T \left(\frac{\partial s}{\partial y}\right)_x - P \left(\frac{\partial v}{\partial y}\right)_x \right] dy$$

$$= \left[T \left(\frac{\partial s}{\partial x}\right)_y - P \left(\frac{\partial v}{\partial x}\right)_y \right] dx + \left[T \left(\frac{\partial s}{\partial y}\right)_x - P \left(\frac{\partial v}{\partial y}\right)_x \right] dy$$

$$= \left[T \left(\frac{\partial s}{\partial x}\right)_y - P \left(\frac{\partial v}{\partial x}\right)_y \right] dx + \left[T \left(\frac{\partial s}{\partial y}\right)_x - P \left(\frac{\partial v}{\partial y}\right)_x \right] dy$$

$$= \left[T \left(\frac{\partial s}{\partial x}\right)_y - P \left(\frac{\partial v}{\partial x}\right)_y \right] dx + \left[T \left(\frac{\partial s}{\partial y}\right)_x - P \left(\frac{\partial v}{\partial y}\right)_x \right] dy$$



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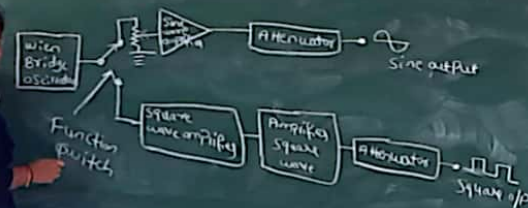
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