Vivekanand College, Kolhapur. (Autonomous)
Department of Physics
Internal Examination Notice
2019-20

Date: 15/01/2020

All students of class B.Sc. I, B.Sc. II and B.Sc. III are hereby noticed that the second term internal evaluation examination is scheduled as per following time table.

Nature of question paper:

For B.Sc. I : Long answer question (Any one from given two questions) for 10 marks

Short answer question (Any two from given three questions) for 10 marks

For B.Sc. II : Long answer question (Any one from given two questions) for 10 marks

Short answer question (Any two from given three questions) for 10 marks

For B.Sc. II (Astro) : Long answer question (Any one from given two questions) for 10 marks

Short answer question (Any two from given three questions) for 10 marks

For B.Sc. III : Long answer question (Any one from given two questions) for 10 marks

Short answer question (Any two from given three questions) for 10 marks

Internal Evaluation Examination 2019-20.
SEM II, SEM IV and SEM VI
Time Table

Sr. No.	Class	Paper	Date	Time
1.	B.Sc. I	Paper II	27/01/2020	11:00 am to 12:00 pm
2.	B.Sc. II	Paper IV	27/01/2020	11:00 am to 12:00 pm
3.	B.Sc. II (Astrophysics)	Paper II	28/01/2020	11:00 am to 12:00 pm
4.	B.Sc. III	Paper VII (section I)	29/01/2020	11:00 am to 12:00 pm
		Paper VII (section II)		01:00 am to 02:00 pm
		Paper VIII (section I)	30/01/2020	11:00 am to 12:00 pm
		Paper VIII (section II)		01:00 am to 02:00 pm

VIVEKANAND COLLEGE ESTD JUNE 1964 KOLHAPUR - 416003

HOD
Head of the
Department of Physics
Vivekanand College, Kolhapur

Seat No.	O.P. Code

"Education for Knowledge, Science and Culture"
-Shikshanmaharshi Dr. Bapuji Salunkhe
Shri Swami Vivekanand Shikshan Sanstha, Kolhapur

Vivekanand College, Kolhapur (Autonomous)
B. Sc. Part-II (Semester- IV)
Internal Examination
Subject: Physics Paper IV
Title of the Paper: THERMAL PHYSICS AND STATISTICAL MECHANICS – II & WAVES AND OPTICS-II
Paper Code: DSC-1001D

Day and Date: 15/02/2020 **Total Marks: 20**
Time: 2.30pm to 3.30 pm
Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of Scientific calculator or Log table is allowed.
4) Draw the neat labeled diagram whenever necessary

Q.1) Attempt any one (10)

i) With neat labeled diagram, obtain Newton's formula.

ii) Derive Plank's law of radiation.

Q.2) Attempt any two (10)

i) Write a note on principle plane.

ii) Show that angular magnification is γm is equal to one.

iii) Obtain the relation for thermodynamic potential.

iv) Describe phase space in details.

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Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur

(Autonomous)

Department of Physics

Internal exam

B.Sc.II Sem IV

Date:- 27/01/2020

Attendance Sheet

Roll No.	Name Of The Student	Signature
7550	Bachche Aomkar Prakash	
7551	Banasavade Omkar Devadas	
7552	Bhatale Sachin Sakharam	
7553	Gole Gaurav Rajaram	
7554	Gurav Rutuja Ravindra	
7556	Khandekar Pooja Sanjay	
7557	Khatangale Shubhangi Prakash	
7558	Khatkale Prashant Prakash	
7559	Kudalkar Prajakta Shivaji	
7560	Mali Rohit Maruti	
7561	More Shubham Laxman	
7562	Padaval Vaibhav Sadashiv	
7563	Parab Vinayak Sumant	
7564	Patil Aakansha Bhimarao	
7565	Patil Akshay Dhanaji	
7566	Patil Aniket Ananda	
7567	Patil Anuja Dattajirao	
7568	Patil Prajkta Krushnat	
7569	Patil Shivani Vishnu	
7570	Pawar Aakash Anandrao	
7571	Pirai Omkar Baban	
7572	Rane Rohit Ramdas	
7573	Salokhe Atish Pundlik	
7574	Satbige Shivanand Sanjeev	
7575	Sayyad Alsaba Javed	
7576	Shelar Avinash Sanjay	
7691	Chavan Satish Rangrao	
7692	Chokakkar Viraj Vijay	
7693	Chougale Tejaswini Bajirao	
7694	Chougule Snehal Anil	
7695	Chougule Abhinandan Mahaveer	

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7698	Desai Ashwini Amarsinh	
7699	Gaikwad Amrita Prakash	
7700	Gawade Vinayak Arjun	
7701	Ghorpade Dattatray Vishnu	
7702	Gotkhinde Shrutika Bharat	
7703	Josef Susen Livis	
7704	Kadam Sainath Subhash	
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7706	Kamble Mrunali Ramesh	
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7710	Khambe Manisha Madhukar	
7711	Khandekar Sandip Sukumar	
7712	Khot Akash Balaso	
7713	Khude Gouri Angad	
7714	Koli Sayali Santosh	
7715	Kumbhar Pratiksha Appaso	
7716	Latthe Sammed Rajendra	
7717	Lohar Neha Shankar	
7718	Mali Anurag Pundlik	
7719	Mardane Pratiksha Shrikant	
7720	Methe Kishori Prakash	
7721	Mote Ramesh Annappa	
7722	Mudekar Rutuja Ramachandra	
7723	Mulani Subiha Husen	
7724	Paladiya Priyanka Shantilal	
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7728	Patil Prakash Ananda	
7729	Patil Rutuja Bhanudas	
7730	Patil Shilpa Shivaji	
7731	Patil Sunita Ashok	
7733	Phonde Vaishnavi Dinkar	
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7735	Sardesai Rutuja Rahul	
7736	Savant Komal Anil	
7737	Sharma Ankita Raviraj	
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7785	Ghorpade Sunil Uttam	
7786	Kamble Ashish Sunil	
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7791	Patil Mandar Dnyandeo	
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7793	Patil Rutuja Bharat	
7794	Patil Sanyogita Sanjay	
7795	Patil Snehal Namdev	
7796	Powar Mayuri Pandurang	
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7798	Sawant Swati Ajit	
7799	Sharbidre Pranav Sunil	
7800	Shinagare Bharat Shivaji	
7801	Sonkamble Rohan Raju	
7802	Sutar Deepak Vishvanath	
7803	Valunj Amarja Digambar	
7732	Patil Vijayraj Maruti	
7804	Amate Punam Vitthal	
7805	Bendke Mukta Vikas	
7806	Bhandari Pratiksha Kiran	
7807	Carvalho Alex Motes	
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7809	Chougale Priyanka Bajirao	
7810	Devardekar Unmesha Sunil	
7811	Ekal Prathamesh Shivanand	
7812	Jadhav Digvijay Suresh	
7813	Jangam Shivkrupa Pramod	
7814	Karale Shubham Mansing	
7815	Kasar Siddhant Shashikant	
7816	Kashidkar Kishor Balaso	
7817	Kasture Yashdeep Anand	
7818	Kodag Sneha Shivaji	
7819	Kumbhar Akshay Dadaso	
7820	Marathe Kunal Sandeep	
7821	Mullani Kashish Sameer	
7823	Nikam Sneha Bajarang	
7824	Nirmalkar Mayuri Chandrakant	
7825	Patil Afanan Ashafak	
7826	Patil Akanksha Dhanaji	
7827	Patil Akshata Ravindra	
7828	Patil Mayuri Tukaram	
7829	Patil Nandini Sunil	
7830	Patil Rushikesh Eknath	
7831	Patil Saurabh Dinkar	
7832	Patil Shivali Balaso	
7833	Patil Sourabh Suhas	
7834	Pawar Pratiksha Ramesh	
7835	Powar Supriya Madhukar	
7836	Powar Vaishnavi Shankar	

VIVEKANAND COLLEGE KOLHAPUR ESTD JUNE 1964 (Autonomous)

7837	Raghani Ritik Dinesh	
7838	Ramsing Bhagyashri Shamrao	
7839	Sabale Abhishek Dattatray	
7840	Sajnikar Divya Netaji	
7841	Sankpal Prajakta Bajirao	
7842	Shinde Dhanashri Dadaso	
7843	Shinde Manisha Appasaheb	
7844	Shinde Neha Dattatray	
7845	Shinde Prajakta Ramchandra	
7846	Shinde Rutuja Sunil	
7847	Shirale Sayali Rajendra	
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7849	Ubale Akanksha Kumar	
7850	Vadgave Sakshi Shamsundar	
7851	Suryvanshi Smital Jaysingrao	
7852	Bedagkar Gauri Rahul	
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7855	Hiremath Seema Sharanayya	
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7864	Shetke Pushkraj Umesh	
7865	Shinde Siddhesh Shivaji	
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7868	Gharale Karan Manohar	
7555	Kanade Priyanka Swatantryakumar	
7870	Kalugade Sourabh Ravindra	
7871	Sawant Arati Ashok	
7872	Shetke Atharav Sanjay	
7873	Punekar Dipali Anil	
7874	Kharase Rushikesh Dayanand	

Internal Examinar.. Dr. Trupti U. Vrunkar

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।। ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार ।।
- शिक्षणमहर्षी डॉ. बापूजी साळुंखे 27453

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Name:- Aaryan Patil

Suppliment No. :

Roll No. : 8012

Class : BSc - III

Signature of Supervisor

Subject : Physics Elements of modern Physics

Test / Tutorial No. : Internal exam

Div. : 17/20

Q1.

1) (ii) ~~ionic~~

2) (ii) L

3) (iv) $\Delta J = \pm 1/2$

4) (i) Stokes lines.

5) (i) Sodium Nitrate 04

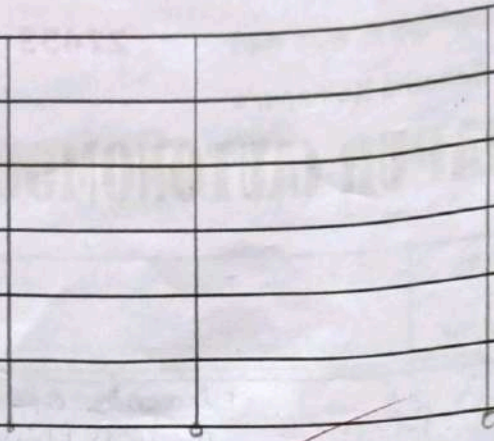
Q2.

1) In the quantum theory of Raman effect the three visible lines are present i.e. Rayleigh line, the stokes line and the antistokes line.

The Rayleigh line is denoted by ν

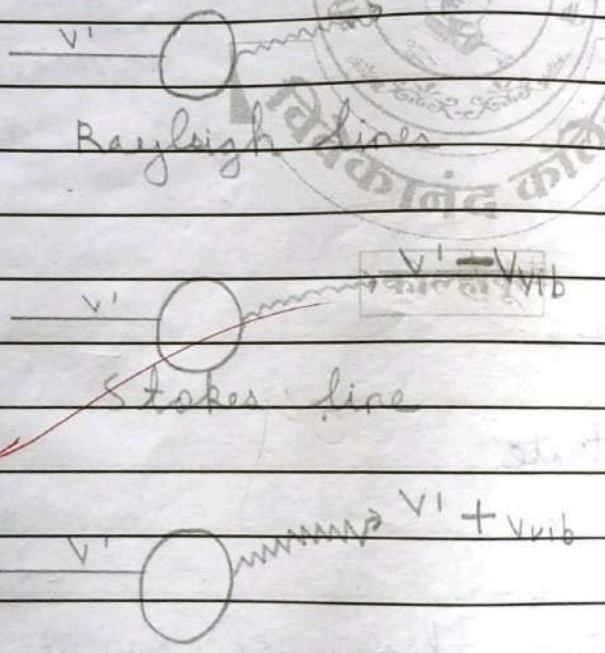
Stokes line is denoted by $\nu' - \nu_{vib}$

antistokes line is denoted by $\nu' + \nu_{vib}$



Stokes line — Rayleigh line — Anti Stokes line

Here, The three visible lines are on the course of Rayleigh line, Stokes line and Anti Stokes line.



In the Rayleigh lines, the energy of the molecules is not transferred and hence no change takes place in the breaking of bonds.

In the Stokes line, the energy of the molecules is transferred but the energy

which is being transferred is in negative. In the antistokes line, the energy which is transferred is in the positive and hence breaking of bonds takes place.

There are a few applications of Raman effect.

1. It is used to describe the molecular structure of the molecules.

2. It is used to calculate the rotational and the vibrational energies of the molecules.

3. It is used to describe the composition of the molecule.

4. It is used for the real arrangement of atoms in the molecule.

5. It is used to predict the spin quantum properties of the molecule.

06

Q3.

1) On the basis of bond formation, there are four types of bond formations which takes place in the molecule.

1. Ionic bond
2. Covalent bond
3. Van der walls
4. No bonds

(i) Ionic bond :- Its formation takes place when one or more electrons from the atom of one molecule is shared to the atom of another molecule is called as an ionic bond. Hence ionic bond is strong in nature.

(ii) Covalent bond :- Heat is required in order to supply external energy for the bond transfer to take place. In Covalent bond, the atoms are shared in between two atoms of two molecules.
ex :- Na^+ and Cl^- ions form $NaCl$ molecule which is complex in nature.

(iii) Van der Waals bond :- The bond which is formed in between two atoms of two molecules using strong Van der Waals forces are called as Van der Waals bond. These Van der Waals forces may be strong or weak. These forces of attraction depend on the heat supplied.

(iv) No bond :- When sometimes during a reaction, the ion exchange does not take place, so there is sometimes no bond formation in between the two atoms of the two molecules. Hence in such situations, no bond is formed. So sometimes no bond is formed during ion exchange in between the atoms.

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SUPPLIMENT

Signature of Supervisor

Suppliment No. :
Roll No. : 7051
Class : B.Sc. II

Subject : Physics
Test / Tutorial No. : Internal 24/30
Div. : A

Q.1

Q1

→ For perfect blackbody coefficient of absorption is one

Q.2

→ Following equation represents wein displacement law where notations have their usual meaning $\lambda_m T$ = constant.

Q3

→ The energy of plank's oscillator is $nh\nu$.

Q.4

→ The blackbody radiation spectrum in shorter wavelength region can be verified by wein's distribution law.

Q.5

→ The energy radiated per second per unit area by perfect blackbody at temperature T is proportional to. T^4

Q.6

→ Newton's rings are localized fringes.

Q.7

→ The fringes obtained in wedge shaped thin film are of increasing thickness.

Q.8

→ The center of Newton's rings due to reflected light is dark.

Q.9

→ Two sources are said to be coherent if they have constant phase difference.

Q.10

→ In Lloyd's single mirror experiment, the central fringe is observed to be dark.

07

Q.2

①

→ ~~We take a spherical radiation~~

We take a spherical enclosure in which the blackbody radiations are taken. Now we have plank's law of radiation in freqwency ν and $\nu + d\nu$.

$$E_\nu \, d\nu = \frac{8\pi h \nu^3}{(e^{h\nu/kT} - 1)\, c^3} \, d\nu \qquad \text{——— ①}$$

This energy density per unit area per unit time.

This is Energy density for respective region for whole area enclosure we have to integrate eq. ①.

$$\therefore \quad E = \int_0^\infty E_\nu \, d\nu$$

$$E = \int_0^\infty \frac{8\pi h \nu^3}{(e^{h\nu/kT} - 1) c^3} \, d\nu$$

$$E = \frac{8\pi h}{c^3} \int_0^\infty \frac{\nu^3}{(e^{h\nu/kT} - 1)} \, d\nu$$

Now take $\frac{h\nu}{kT} = x$

$$\nu = \frac{kT}{h} x$$

ν	0	∞
x	0	∞

$$d\nu = \frac{kT}{h} dx$$

Putting all these value.

$$E = \frac{8\pi h}{c^3} \int_0^\infty \frac{\left(\frac{kT}{h} x\right)^3}{e^{h \frac{kT}{h} x} - 1} \cdot$$

$$E = \frac{8\pi h}{c^3} \int_0^\infty \frac{\left(\frac{kT}{h} x\right)^3}{(e^x - 1)} dx \cdot \frac{kT}{h}$$

$$E = \frac{8\pi h}{c^3} \int_0^\infty \frac{\frac{K^4T^4}{h^4} x^3}{e^x - 1} dx$$

$$E = \frac{8\pi K^4 T^4}{c^3 h^3} \int_0^\infty \frac{x^3}{e^x - 1} dx.$$

We know the direct integral of $\int_0^\infty \frac{x^3}{e^x - 1} dx$

$$E = \frac{8\pi K^4 T^4}{c^3 h^3} \cdot \frac{\pi^4}{15}$$

$$E = \frac{8\pi^5 K^4 T^4}{15 c^3 h^3}$$

$$E = AT^4$$

where $A = \frac{8\pi^5 K^4}{15 c^3 h^3}$ = constant.

$\therefore E \propto T^4$

The ~~E~~ Energy of the blackbody per unit area per second is directly proportional to Fourth power absolute temperature.

Now ~~In~~ case the blackbody have small hole in it Then the blackbody act as perfect blackbody.

The radiations coming out of the hole / opening ~~per~~ unit area per second is directly proportion to Energy.

$E' \propto E$

$E' = A' E$

$A' = \text{constant} = \frac{1}{4} c$

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27126

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SUPPLIMENT

Signature of Supervisor	

Suppliment No. : 2
Roll No. : 7751
Class : B.Sc.

Subject : physics
Test / Tutorial No. : Internal
Div. : A

$E' = \frac{1}{4} cE$

We know $E = AT^4$

$E' = \frac{EAT^4}{4}$

$E' \propto T^4$

where $\frac{AE}{4}$ = ~~constant~~.

This is Steffan's law from plank's law.

09

Name :- Shivani Shivaji Ghatage

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27103

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

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SUPPLIMENT

Signature of Supervisor	

Suppliment No. : 1
Roll No. : 7048
Class : BSC. II

Subject : Physics
Test / Tutorial No. : Internal Examination
Div. : A

27/30

Q1)

1) For perfect black body coefficient absorption is one

2) Following eqn represents wien's displacement law where notations have their usual meaning $\lambda_m T$ = constant

3) The energy of plank's oscillator is kT

4) The black body radiation spectrum in shorter wavelength region can be verified by wien's distribution law

5) The energy radiated per second per unit area by perfect black body at temperature T is proportional to T^4

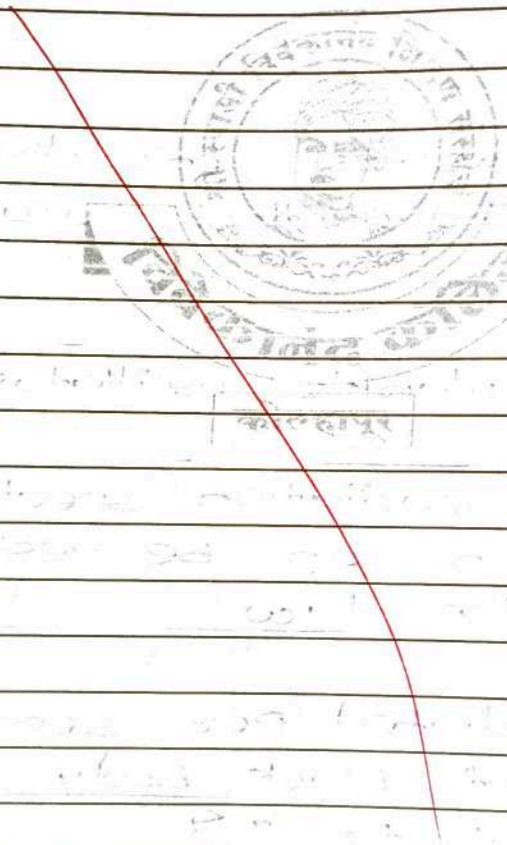
6) Newton's rings are localized fringes

7) The fringes obtained in wedge shaped thin film are of equal thickness

8) The center of newtons rings due to reflect
light is dark

9) Two sources are said to be coherent if th
have all of above

10) In Lloyd's single mirror experiment, the c
fringe is observed to be. dark



tefan's law from plank's law.

modes of vibration :- the + It is defined as the total energy per unit No. of moles of vibrati's called modes of vibrations.

$$\bar{\epsilon} = \frac{E}{N}$$

$$N_1 = N_0 e^{-\epsilon/KT}$$

$$N_2 = N_0 e^{-2\epsilon/KT}$$

$$N_3 = N_0 e^{-3\epsilon/KT}$$

$$N = N_1 + N_2 + N_3$$

$$= N_0 \left(1 + e^{-\epsilon/KT} + e^{-2\epsilon/KT} + \dots\right)$$

$$= N_0 (1-y)^{-1}$$

$$N = \frac{N_0}{(1-y)}$$

put $\left(y = e^{-\epsilon/KT}\right)$

$$N = \frac{N_0}{(1 - e^{-\epsilon/KT})}$$

$$E = \left(\epsilon N_0 e^{-\epsilon/KT} + 2\epsilon N_0 e^{-2\epsilon/KT} + \dots\right)$$

$$E = \epsilon N_0 \left(e^{-\epsilon/KT} + 2 N_0 e^{-2\epsilon/KT} + \dots\right)$$

$$= \epsilon N_0 e^{-\epsilon/KT} \left(1 + 2e^{-\epsilon/KT} + \dots\right)$$

put $e^{-\epsilon/KT} = y$

$$= \epsilon N_0 y \left(1 + 2y + 3y^2 + \dots\right)$$

$$= \epsilon N_0 y (1-y)^2$$

$$= \frac{\epsilon N_0 y}{(1-y)^2}$$

$$E = \frac{\epsilon N_0 e^{-\epsilon/KT}}{(1 - e^{-\epsilon/KT})^2}$$

$$\bar{\epsilon} = \frac{E}{N} = \frac{\epsilon N_0 e^{-\epsilon/KT}}{(1 - e^{-\epsilon/KT})^2} \times \frac{(1 - e^{-\epsilon/KT})}{N_0}$$

$$= \frac{\epsilon e^{-\epsilon/KT}}{1 - e^{-\epsilon/KT}}$$

~~$\bar{\epsilon} = \frac{E e^{-E/KT}}{}$~~

$$\epsilon = \frac{E}{e^{\epsilon/KT}(1 - e^{-\epsilon/KT})}$$

$$\epsilon = \frac{E}{(e^{\epsilon/KT}) - 1}$$

$$\epsilon = \frac{h\nu}{e^{h\nu/KT} - 1}$$

$E_\nu d\nu$ = Average energy x No. of moles of vibs per unit volume

$$E_\nu d\nu = \frac{h\nu}{e^{h\nu/KT} - 1} \times \frac{8\pi\nu^2}{c^3} d\nu$$

$$= \frac{8\pi}{c^3} \frac{h\nu^3}{e^{h\nu/KT} - 1} d\nu$$

$$E_\lambda d\lambda = \frac{8\pi hc}{c\lambda^5 (e^{hc/\lambda KT} - 1)}$$ $d\lambda$ is the Stefan's law from plank's law.

Name :- Shivani Shivaji Ghatage

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27130

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	

Suppliment No. : 2

Roll No. : 7748

Class : BSc. II

Subject : Physics

Test / Tutorial No. : Internal Examination

Div. : A

Q3)

1) Deduce Rayleigh-Jeans law from plank's law

→ We know that,

$$E_\lambda d\lambda = \frac{8\pi hc}{\lambda^5 c(e^{hc/\lambda KT} - 1)}$$

Rayleigh's law applicable for largest wavelength length of the long wavelength then the reverse $hc/\lambda KT$ is small.

i.e. $e^{hc/\lambda KT} = hc/\lambda KT$

Now, $= \frac{8\pi hc}{\lambda^5} \times \frac{1}{hc/\lambda KT}$

$\therefore \frac{8\pi hc \times \lambda KT}{\lambda^5 \times hc}$

$= \frac{8\pi KT}{\lambda^4}$ is the Rayleigh-Jeans law from plank's law.

VIVEKANAND COLLEGE KOLHAPUR (Autonomous) ESTD JUNE 1964

Aishwarya Sanjay Chavan.

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27073

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	

Suppliment No. : 01
Roll No. : 7042
Class : B.SC II

Subject : Physics
Test / Tutorial No. : Internal Exam
Div. : A

22/30

Q. 1)

1) For perfect black body coefficient of absorption is
i) zero

2) Following equation represents Wien's displacement law where notations have their usual meaning
i) $\lambda_m T$ = Constant

3) The energy of plank's oscillator is iv) $nh\nu$

4) The black body radiation spectrum in shorter wavelength region can be verified by
iii) Wien's distribution law.

5) The energy radiated per second per unit area by perfect black body at temperature T is proportional to
i) T^4.

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6) Newton's rings are i) localized fringes.

7) The fringes obtained in wedge shaped thin film are of i) increasing thickness

8) The center of Newton's rings due to reflected light is i) dark.

9) Two sources are said to be coherent if they have iii)
→ Constant phase difference.

10) In Lloyd's single mirror experiment, the central fringe is observed to be ii) dark.

06

2) Stefan's Law from plank's law.

we have planks law of radiation in term

$$E\lambda d\lambda = \frac{-8\pi hc\, d\lambda}{\lambda^5 (e^{hc/\lambda KT} - 1)}$$

07

) Rayleigh-Jean's Law from planks law.

We have planks law of radiation in term

$$E\lambda d\lambda = \frac{-8\pi hc\, d\lambda}{\lambda^5 (e^{hc/\lambda KT} - 1)}$$

Rayleigh-Jean's law is aplicable for ~~on~~ large Wavelength

The term $\frac{hc}{\lambda KT}$ is very small.

Hence λ is very very large.

We can write

$$E\lambda d\lambda = \frac{-8\pi hc\, d\lambda}{\lambda^5 (e^{hc/\lambda KT})}$$

we can write

$$e^{hc/\lambda KT} = 1 + \frac{hc}{\lambda KT}$$

$$e^{hc} \; E\lambda d\lambda = \frac{-8\pi hc\, d\lambda}{\lambda^5 (e^{hc/\lambda KT})} \times \frac{\lambda KT}{hc}$$

$E\lambda d\lambda = \frac{-8\pi hc}{\lambda^4} = \frac{-8\pi KT d\lambda}{\lambda^4}$

Above eqn is Rayleigh-Jean law from plank's Law

$$E\lambda d\lambda = \frac{-8\pi KT d\lambda}{\lambda^4}$$

Q.3) Wien's distribution law from plank's Law.

We have planks law of radiation in term.

$$E\lambda d\lambda = \frac{-8\pi hc \, d\lambda}{\lambda^5 (e^{nc/\lambda KT} - 1)}$$

wien's distribution is aplicable for only short Waveleng

For short Wavelength

the term $e^{nc/\lambda KT}$ is large as compare to 1.

Hence we can write

$$e^{nc/\lambda KT} - 1 \approx e^{nc/\lambda KT}$$

eqn (1) becomes.

$$E\lambda d\lambda = \frac{-8\pi hc \, d\lambda}{\lambda^5 (e^{nc/\lambda KT})}$$

$$E\lambda d\lambda = \frac{-8\pi hc \, d\lambda}{\lambda^5 (e^{nc/\lambda KT})}$$

∴ Above equation reprsentes Wiens distribution law from plank's Law.

।। ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार ।।
– शिक्षणमहर्षी डॉ. बापूजी साळुंखे 27143
Shri Swami Vivekanand Shikshan Sanstha Kolhapur's
VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	

Suppliment No. : 02
Roll No. : 7742
Class : B.SC II

Subject : physics.
Test / Tutorial No. : Internal Exam
Div. : A

Q. 2) stefan's law from planks law.
planks law of radiation

Let cubic incloser contain N No of oscilltions E be their total energy.
The total energy of all oscilltor.

$$\bar{e} = \frac{E}{N} \quad \text{—②}$$

Let N_0, N_1, N_2 be the Number of oscilltions having energy $0, \epsilon, 2\epsilon$.
Then we have following relations.

$$N_1 = N_0 e^{-\epsilon/KT}$$
$$N_2 = N_0 e^{-2\epsilon/KT}$$
.
.
.

∴ The total No of oscillation, molecules are given by.

$$N = N_0 + N_1 + N_2 + \cdots$$

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur (Autonomous)

Internal Examination 2019-20

B.Sc. II, Sem IV

Astrophysics

(Celestial Mechanics and Introductory Quantum Mechanics)

Time: 30 Minutes Marks: 20

Q.1] Long answer question (Attempt any one of the following) **(10)**

1)Derive the expression for Equation of continuity in three dimensions

2) Derive equation of motion of on ideal fluid.

Q.2) short answer question (Attempt any TWO of the following) **(10)**

1) What is Galaxy? What are the types of galaxies

2) Write a note on Seyfert Galaxy.

3)Write a note on Comet.

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur

(Autonomous)

Department of Physics

Internal exam

B.Sc.II (Astrophysics) Sem IV

Date:- 28/01/2020

Attendance Sheet

Roll No.	Name Of The Student	Signature
7550	Bachche Aomkar Prakash	
7551	Banasavade Omkar Devadas	
7552	Bhatale Sachin Sakharam	
7553	Gole Gaurav Rajaram	
7554	Gurav Rutuja Ravindra	
7556	Khandekar Pooja Sanjay	
7557	Khatangale Shubhangi Prakash	
7558	Khatkale Prashant Prakash	
7559	Kudalkar Prajakta Shivaji	
7560	Mali Rohit Maruti	
7561	More Shubham Laxman	
7562	Padaval Vaibhav Sadashiv	
7563	Parab Vinayak Sumant	
7564	Patil Aakansha Bhimarao	
7565	Patil Akshay Dhanaji	
7566	Patil Aniket Ananda	
7567	Patil Anuja Dattajirao	
7568	Patil Prajkta Krushnat	
7569	Patil Shivani Vishnu	
7570	Pawar Aakash Anandrao	
7571	Pirai Omkar Baban	
7572	Rane Rohit Ramdas	
7573	Salokhe Atish Pundlik	
7574	Satbige Shivanand Sanjeev	
7575	Sayyad Alsaba Javed	
7576	Shelar Avinash Sanjay	
7852	Bedagkar Gauri Rahul	
7853	Chavan Ramchandra Ashok	
7854	Dayama Abhishek Ashok	
7855	Hiremath Seema Sharanayya	
7856	Jadhav Nikhil Sandeep	

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7857	Kalgutkar Aakash Rajendra	
7858	Kore Jyoti Vinayak	
7859	Mane Malhar Uday	
7860	Patil Omkar Dhanaji	
7861	Patil Omkar Janaba	
7862	Sarnaik Kunal Ketan	
7863	Shaikh Soufeen Shahmahmad	
7864	Shetke Pushkraj Umesh	
7865	Shinde Siddhesh Shivaji	
7866	Waghmode Kiran Bhimrao	
7867	Yadav Durga Vaijanath	
7868	Gharale Karan Manohar	
7555	Kanade Priyanka Swatantryakumar	
7870	Kalugade Sourabh Ravindra	
7871	Sawant Arati Ashok	
7872	Shetke Atharav Sanjay	
7873	Punekar Dipali Anil	
7874	Kharase Rushikesh Dayanand	

Internal Examinar... Dr. Trupti U. Urunkar

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-शिक्षणमहर्षी डॉ. बापूजी साळुंखे

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	

Suppliment No. : 25

Roll No. : 7484

Class : B.Sc - II

Subject : Astrophysics

Test / Tutorial No. :

Div. :

Q.1)

1) d) their distance from earth

2) c) radio galaxies

3) a) 76 years

4) b) group of stars

5) a) Spiral galaxy

6) a) absorption

7) a) O

8) d) M

9) b) stable

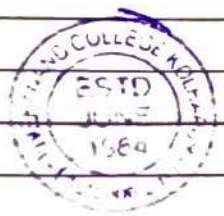
10) b) red old star.

Q 2>

3> Luminosity of Star →

Luminosity is the total amount of electromagnetic theory emitted per unit time by an object. In SI system luminosity is measured in two Joules/second. The luminosity is measured in two forms namely visible light and bolometric luminosity. Generally the term luminosity means bolometric luminosity. The intrinsic brightness of a star is called its absolute luminosity. which depends upon the size and temp of the star. temp of the star is equivalent to that of a black body reporducing the same power. The aperent luminosity is the observed luminosity which depends upon its absolute luminosity & distance from the observer.

The luminosity of a celestial body is indicated in terms of magnitude. The concept of magnitude was first introduced by greet astronomer Hipparchus in 2nd century BC. It was assumed that all stars are moving on the surface of celestial sphere having radius of 20,000 Re. Initially the stars were grouped into 6 distrete categories depending upon their apparent brightness. The first magnitude stars are twice as bright as the next magnitude stars. The second was twice as third and so on. down to the faintest stars. (6th magnitude).



Q.2)

1) Measurement of brightness of a star is relative because one can compare the luminocities of two stars or luminosity of a star with an artificial standard source of light. Apart from visual method, the photographic and photoelectric method are used for luminosity measurement.

* Photographic method →

This method is used after 1840 AD and uses the principle of photography. ie. when a photographic plate is exposed to light and developed the intensity of light is reflected on the photograph. When equal exposure time & identical conditions of photographic plate development is carried then stars of equal luminosities produce an image of equal diameter. The optical image of a star is very small but due to scattering of photons through photographic imulsion produce image of considerable size the size of image proportional to luminosity of a star.

Initially with a single starlight the photographic plates are exposed of different times like 5, 10, 20, 40, 80 seconds. etc. & images are developed. The nature of images are shown.

Now the light from the star whose luminosity is to be measured is focused on the photographic plates for known exposure time & image is developed.

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VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	

Suppliment No. : (19)

Roll No. : 7487

Class : B.Sc II

Subject : Astrophysics

Test / Tutorial No. : Internal exam

Div. :

Q.1

1) d) Their distance from earth

2) c) radio galaxies

3) a) 76 years

4) b) group of stars

5) a) spiral galaxy

6) a) absorption

7) a) O

8) d) F9

9) b) stable

10) b) red old star

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Q. 2

12 Measurement of brightness of a star is relative because one can compare the luminocities of two stars or luminosity of a star with an artificial standard source of light. Apart from visual method, the photographic and photoelectric method are used for luminosity measurement.

* Photographic method *

This method is used after 1840 AD and uses the principle of photography i.e when a photographic plate is exposed to light and developed the intensity of light is reflected on the photograph. When equal exposure time & identical conditions of photographic plate development is carried then stars of equal luminosities produce an image of equal diamete. The optical image of a star is very small but due to scattering of photons through photographic imulsion. produce image of considerable size the size of image proportional to luminosity of a star

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