Department of Physics

Vivekanand College, Kolhapur (Autonomous)

Notice for Internal Examination in Physics for B.Sc. – I and II

It is hereby informed that, students of B.Sc. – I and II should note that their Internal Examination in Physics will be conducted as per following time – table.

Date	Time	Class	Subject
Monday, 30/11/2022	11.00 to 12.00 AM	B.Sc. – II (Astrophysics)	Paper – I
			Paper – II
Monday, 28/11/2022	10.00 to 11.00 AM	B.Sc. – I	Physics Paper – I
			Physics Paper – II
Monday, 28/11/2022	10.00 to 11.00 AM	B.Sc. – II	Physics Paper – V
			Physics Paper – VI

Nature of Question Paper

Q.1) Select correct alternative (10 Marks)
Q.2) Long answer type question (10 Marks, Attempt any One)
Q.3) Short answer type question (10 Marks, Attempt any Two)
Total Marks: 30 Marks

HOD, Physics

Head of the
Department of Physics
Vivekanand College, Kolhapur

ESTD
JUNE
1964
KOLHAPUR - 416003
VIVEKANAND COLLEGE

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur (Autonomous)

Internal Examination 2022-23

PHYSICS-DSC -1001C

B.Sc. – II, Sem – III (Thermal and statistical physics I and Waves and Optics I)

Time: 30 Minutes   Marks: 30

Q. 1. Select Correct Alternatives   **(10)**

1. Which of the following physical quantity relates with first law of thermodynamics----
   - (a) Temperature
   - (b) pressure
   - (c) energy
   - (d) volume

2. Internal energy of gas depends on------
   - (a) Temperature
   - (b) pressure
   - (c) entropy
   - (d) volume

3. Chemical equilibrium describes the uniformity of------
   - (a) Temperature
   - (b) pressure
   - (c) entropy
   - (d) volume

4. In adiabatic process the system is thermally ----the surroundings
   - (a) in contact with
   - (b) depends upon
   - (c) isolated from
   - (d) (a) and (c)

5. According to kinetic theory of gases the relation between pressure P, density ρ and mean square velocity C is---
   - (a) $P = \frac{1}{3}\rho c^2$
   - (b) $P = \frac{1}{3}\rho c$
   - (c) $P = \frac{1}{2}\rho c^2$
   - (d) $P = \frac{1}{2}\rho c$

6. The resultant of two or more harmonic displacements is simply algebraic sum of the individual displacement is ……….. principle.
   - (a) Homogeneous
   - (b) non-homogeneous
   - (c) Superposition
   - (d) Alternative

7. Frequency $n = \frac{p}{2l}\sqrt{\frac{T}{m}}$ is the frequency of-----
   - (a) fundamental mode
   - (b) p^{th} overtone
   - (c) p^{th} harmonic
   - (d) none of above

8. The viscosity of a lubricant fuel is …………. value
   - (a) Zero
   - (b) infinity
   - (c) moderate
   - (d) higher

9. Rotary oil pump can produce a vacuum as low as------.
   - (a) 10^{-3} torr
   - (b) 10^5 torr
   - (c) 10^{-5} torr
   - (d) 10^3 torr

10. Microphones are----
    - (a) active transducers
    - (b) passive transducers
    - (c) active as well as passive transducers
    - (d) amplifiers

Q. 2. Long Answer Questions (20)

1) Explain construction and working of thermoelectric thermometer. Explain vector product and its characteristics in detail.

2) Obtain an expression for a flow of a liquid through a horizontal capillary tube. (Poiseuille's formula)

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur

(Autonomous)

Department of Physics

Internal exam (2022-23)

B.Sc.II Sem III

Date:- 28/11/2022

Attendance Sheet

Roll No.	Name Of The Student	Signature
7701	Bhojkar Sanika Satish	Sanika
7702	Chavan Vaishnavi Ganesh	chavan
7703	Chougale Shivani Shrikant	Shivani
7704	Ekashinge Sourabh Amar	Ef
7705	Fernandes Riya Inas	Riya
7706	Gavali Shubham Anil	Gavali
7707	Gujare Om Parshuram	Om
7708	Gujare Omkar Parshuram	Gupte
7709	Jadhav Prerana Suresh	Jathav
7710	Jamadar Karishma Khudbuddin	K
7711	Kamble Priyanka Ashok	Priyanka
7712	Kamble Rutik Viththal	Kamble
7713	Karake Sayyam Deshbhushan	Sayyam
7714	Koli Prajakta Mahesh	Koli
7715	Koruche Pratiksha Dipak	PD
7716	Morbale Aditya Sanjay	Morbale
7717	Mujawar Ammar Mukhtar	Mujawar
7718	Musale Aditya Santosh	Musale
7719	Patil Shreyas Balwant	Patil
7720	Patil Vaishnavi Gorksha	Patil
7721	Shinde Atharva Dattatray	Ashinde
7722	Anchi Siddharth Vikas	Siddharth
7723	Atigre Sarthak Sujit	Sarthak
7724	Buchade Vivek Vasant	Buchade
7725	Chavan Snehal Bhikaji	Chavan
7726	Chougule Rohit Anand	Rohit
7727	Dangar Noor Sanaulla	Dangar
7728	Desai Sejal Anil	Desai
7729	Gadkari Sourav Sharad	Sourav
7730	Jadhav Ananya Netaji	AJadhav
7731	Kumbhar Trupti Arvind	Trupti

7732	Patil Dipti Dilip	
7733	Patil Sudarshan Rajaram	
7734	Pawar Shubham Sudhir	
7735	Pendhari Samir Bakash	
7736	Pirjade Sahad Maksud	
7737	Shinde Ajit Baban	
7738	Shinde Shivam Firoj	
7739	Swami Yash Anil	
7740	Terani Akshata Sanjay	
7741	Burambale Kartik Nandkumar	
7742	Chavan Aishwarya Sanjay	
7743	Chougale Anuja Anil	
7744	Dhavale Pratik Vijay	
7745	Dongare Rushi Chandrakant	
7746	Gaikwad Sanika Balaso	
7747	Gawade Shweta Sanjay	
7748	Ghatage Shivani Shivaji	
7749	Gudle Pallavi Bhujgonda	
7750	Gurav Reva Sunil	
7751	Jadhav Sandesh Daji	
7752	Karne Dipali Ramesh	
7753	Kashid Namrata Maruti	
7754	Magadum Anuja Balaso	
7755	Mane Siddhi Bipinkumar	
7756	Metkari Sourabh Dadaso	
7757	Mohite Srusthi Pandharinath	
7758	More Shivani Pandurang	
7759	Parit Vaishnavi Sudesh	
7760	Patil Hardik Dilip	
7761	Patil Tejaswini Shahajirao	
7762	Rathi Shreya Sanjay	
7763	Satpute Sakshi Pandurang	
7764	Shinde Neha Rajesh	
7765	Shinde Pallavi Savanta	
7766	Shingare Sanskruti Sanjay	
7767	Singh Sadhana Sanjay	
7768	Vhanmane Shubham Abaso	
7769	Demanna Shreyashree Shantinath	
7770	Hasbe Saad Sanjay	
7771	Khilare Rutik Sunil	
7772	Khot Shrutika Sambhaji	
7773	More Omkar Nandkumar	
7774	Pathan Misam Ashfak	
7775	Patil Dhanshree Madhusudan	
7776	Sutar Sushant Vilas	
7777	Shaikh Adnan Mohammadyasin	
7983	Patil Abhishek Ananda	

7984	Desai Pratik Mahesh	P.Desai
7990	Khot Ganesh Vitthal	Khot

Internal Examinar.... *S.S.Lattte*

Q1.

2. Construction and working of CRT

Cathode ray tube is heart of Oscilloscope. Vacuum tube of Special geometrical shape and converts an electrical signal into visual form. Electron gun produces beam of electrons. The electron beam is deflected on its journey in response.

Focusing Anode   Accelerating anode   Horizontal deflecting plates   Screen

Grid

Cathode

Electron gun   Vertical deflection plates   Electron beam
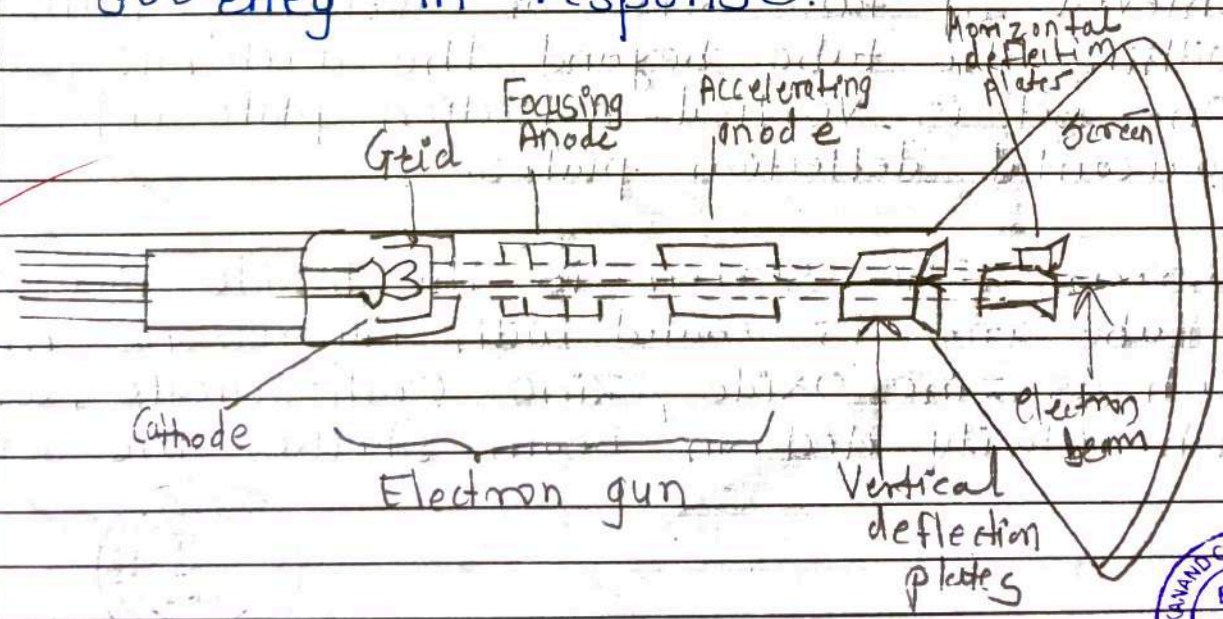
i Glass envelope

It is conical highly evacuated glass housing which contains vacuum inside and support various electrodes. the inner walls of CRT between neck and screen are coated with conducting material.

ii Electron gun assembly –

The arrangement of electrodes which produce focussed beam of electrons is called electron gun. It essentially consists of an indirectly heated cathode, control grid, focussing anode and an accelerating anode.

The cathode consists of nickel cylinder coated with oxide coating and provide plenty of electrons.

iii Deflection plate assembly –

The deflection of the electron beam is achieved by two sets of deflecting plates placed within the tube beyond the accelerating anode. One set is vertical deflection plate and other is horizontal deflection plates.

iv. Screen – The screen is the inside face of the tube and is coated with fluorescent material such as zinc oxide, zinc orthosilicate, when high velocity electron beam strikes the screen

8. Working of CRT

When Cathode is heated, it emits plenty of electrons, these electrons pass through control grid on their journey. The control grid has negative potential. If negative potential on control grid is high, few electrons will pass through it and the electron beam strikes on the screen will produce a dim spot of light. If negative potential on control grid is reduced, the spot of light will be bright

Q.1

2.   Construction :-

i) Glass envelope :-

It is a conical highly evacucited glass housing which contains vacuum inside and support the various electrodes. The inner walls of CRT between neck and screen are coated with a conducting material, called aqudag. This coating is electrically connected to the accelerating anode, so that electrons which accidently strike the walls ar returned to the anode. This prevents the walls of the tube from charging to a high negative potential.

ii) Electron gun assembly :-

The arrangment of electrodes which produce a focused beam of electrons is called the electron gun. It essentially consist of an indirectly heated cathode, a control grid, a focusing anode and an accelerating anode. The control grid is held

negative potential w.r.t cathode whereas the two
anodes are maintained at high positive potential
w.r.t. cathode.

iii) Deflection plate assembly :-
    The deflection of the electron beam is achieved
by two sets of deflecting plates placed within the
tube beyound accelerating anode one set is the
vertical deflection plates and the other set is
the horizontal deflection plates. The vertical
deflection plates are mounted horizontally in the tube
The horizontal deflection plates are mounted in
the vertical plane.

iii) Screen :-
    The screen is the inside face of the tube &
is coated with fluorescent material such as zinc
oxide, zinc orthosilicate etc. When high velocity electron
beam strikes the screen, a spot of light is produced
at the point of impact. The colour of the spot
depends upon the nature of fluorescent material.

Focussing anode   Accelerating anode   Horizontal deflection plate

Grid   Screen

Electron beam

Cathode

Electron gun

vertical deflection plates

Aquadag
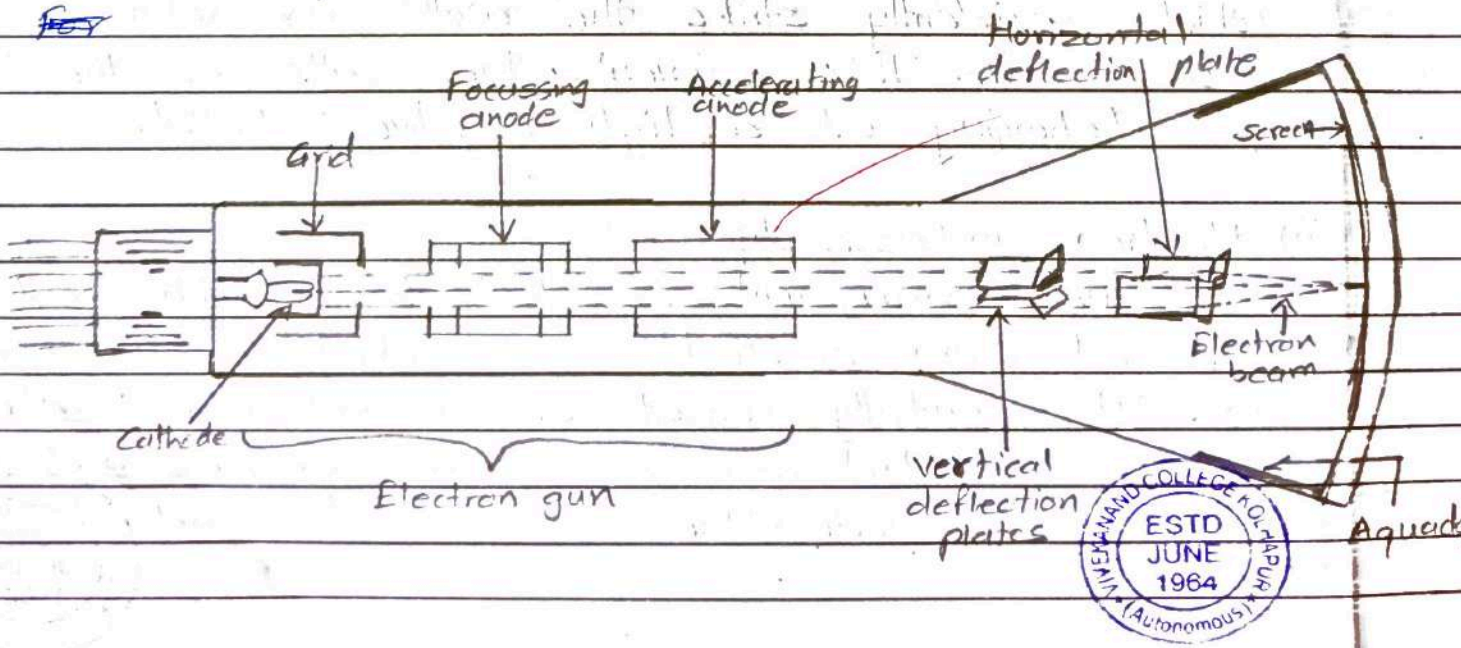
Working :—

When the cathode is heated, it emits plenty of electrons. These electrons pass through control grid on their journey. The control grid has a negative potential. If negative potential on the control grid is high, few electrons will pass through it and the electron beam striking on the screen will produce a dim spot of light. If the negative potential on the control grid is reduced, the spot of light will be bright. Thus, the intensity of light spot on the screen can be changed by changing the negative potential on the control grid. After leaving the control grid, the electron beam comes under the influence focusing and accelerating anodes. These two anodes are maintained at high positive potential. They produce a field which as an electrostatic lens and it converges the electron beam at a point on the screen.

Q2

3) Lissajous figures may be used for accurate measurement of freq. In this method, the signal, whose frequency is to be measured, is applied to the Y-plates and known standard freq. signal is applied to the x-plates of the C.R.O

Unknown freq is calculated by the formula

$$f_y = \frac{\text{number of loops cut by horizontal line}}{\text{number of loops cut by vertical line}} \times f_g$$

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur (Autonomous)

Internal Examination 2022-23

ASTROPHYSICS-DSC -1001C

B.Sc. – II, Sem – III

(Fundamentals of Astronomy and astrophysics)

Marks: 30

Time: 30 Minutes

(10)

Q. 1. Select Correct Alternatives

1) Electromagnetic wave travels through free space with constant speed of light given by c = ...

a) $\sqrt{\lambda}$ b) $\sqrt{+\lambda}$ c) $\sqrt{-\lambda}$ d) $\sqrt{/\lambda}$

2) The energy associated with an electromagnetic wave is given by Planck's law E = ...

a) $h\sqrt{}$ b) $\sqrt{+h}$ c) $\sqrt{-h}$ d) $\sqrt{/h}$

3) Wien's displacement law mathematically given as $\lambda_m T$ = ...

a) 0   b) -2   c) -4   d) constant

4) Doppler shift produced by relative motion between source and observer is given by $\Delta\lambda$ = ...

a) VT   b) V+T   c) V-T   d) V / T

5) Doppler shift produced by relative motion between source and observer is given by $\Delta\lambda$ = ...

a) VT   b) V+T   c) V-T   d) V / T

6) When electron travels from higher energy to lower energy it --------- energy.

a) emits   b) absorbs   c) not emits   d) not absorbs

7) Sodium atom has ------- very intense emission lines.

a) two   b) three   c) four   d) five

8) A stellar spectra is an ------ spectra.

a) emission   b) absorption   c) condensetion   d) convection

9) "O" stars are ------- in color.

a) white   b) bluish   c) red   d) green

10) "B" stars are have surface temperature ranging from 10000 to ------- °K

a) 30000   b) 20000   c) 25000   d) 15000

Q. 2. Long Answer Questions

1) Explain construction and working of Cassegrainian and Newtonian telescope.

2) Write a note on Rayleigh's criterion for resolution.

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- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur

(Autonomous)

Department of Physics

Internal exam (2022-23)

B.Sc.II (Astrophysics) Sem III

Date:- 30/11/2022

Attendance Sheet

Roll No.	Name Of The Student	Signature
7769	Demanna Shreyashree Shantinath	Demanna.
7770	Hasbe Saad Sanjay	Hasbe.
7771	Khilare Rutik Sunil	(PA).
7772	Khot Shrutika Sambhaji	Khot
7773	More Omkar Nandkumar	More
7774	Pathan Misam Ashfak	Pathan.
7775	Patil Dhanshree Madhusudan	Patil
7776	Sutar Sushant Vilas	ssutar.
7777	Shaikh Adnan Mohammadyasin	Ashaikh

Internal Examinar...........SSlottle....................

" ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार "
– शिक्षणमहर्षी डॉ. बापूजी साळुंखे

Shri Swami Vivekanand Shikshan Sanstha's
VIVEKANAND COLLEGE (Autonomous), KOLHAPUR

Class _____ BSc II _____ Div _____ Roll No. 7705

Suppliment No. _____ Subject _____ Astrophysics

Test / Tutorial No. _____ Internal examinatn

Q1. long answer (attempt 1)

1) Derive the expression for eqn of continuity in 3-D dimension.

2) Derive equatn of motion of an ideal fluid.

Q2. short answer equatn (attempt any 2)

1) What is Galaxy. What are the type of Galaxys.

2) Write a note on seyfert galaxy.

3) Write a note on comets.

Q 1.

2) Eurle's equation or equatn of motion of an ideal fluid.
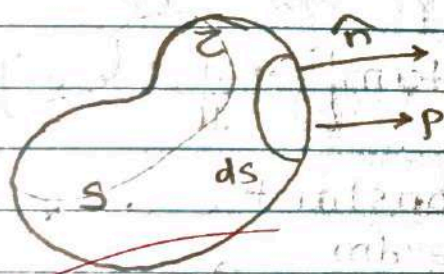
n – vector
dP – pressure
S – surface area
dτ – Volume

By newton's 2nd law of

Total force acting on mass in the fluid is the Rate of change of momentum.

As The total volume of τ surface

Force volume τ is surface area

Body Force + surface Force

Q2. 1) Galaxy :-
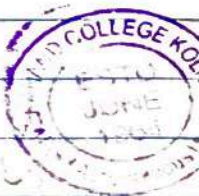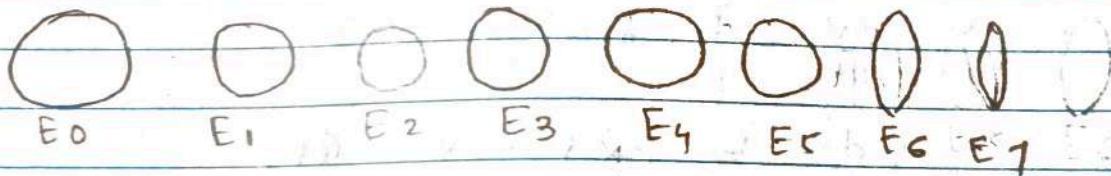   Galaxy is the ~~universe~~ in W study of universe
    Edwin Hubble & found the types of galaxies
    Galaxy ~~is~~ the ~~which stu~~. Found by an Astronomer
    of US. is 1918

1) Types of Galaxy :-
    There four types of Galaxy
    1) Eliptical sp' Galaxy
    2) Spiral galaxy
    3) Barred spiral galaxy
    4) Irregular galaxy.

1) Eliptical galaxy :-

EO   E1   E2   E3   E4   E5   E6 E7

    An eliptical galaxy is look like party
    Flattened luminous sphere. Some galaxies
    are nearly perfect sphere. or other galaxies
    are moderately.
        ~~In~~ Hubble &abbled all eliptical galaxies
    ·. According to there shape. He ·.
        It contains ~~old~~ old stars no young
    stars are found in it. ~~Because~~ old stars
    are very luminous. Young stars faint.
    .. He slightly designated Eo to so upto E7
    The relativel galaxy is large and massive.

Signature of Supervisor

ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार "
– शिक्षणमहर्षी डॉ. बापूजी साळुंखे

Shri Swami Vivekanand Shikshan Sanstha's
VIVEKANAND COLLEGE (Autonomous), KOLHAPUR

Class _____ Div _____ Roll No. 7.505

Suppliment No. _____

Test / Tutorial No. _____ Subject _____

2) Spiral galaxies :-

spiral galaxy is look like in Flat shape, It sp stars in spiral concentrated in the centre shap and in the spiral arm. the spiral arm is known as spiral galaxy. the spiral arm rotate like pinwheel in Firwork stars. It rotate too slowly For us. spiral arms are curved so it very impressive to observer. Hubble des divided it in three type Sa, Sb & Sc.

The sa type spiral is ret type in which close togegether & overlaping on each. So this type such galaxy are hardly to be seen.

The sb type spiral galaxy is well define as shown in Fig.

The sc type spiral galaxy is only arm each being clearly separated From each other.

The mass of spiral galaxy is

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– शिक्षणमहर्षी डॉ. बापूजी साळुंखे

Signature of
Supervisor

Shri Swami Vivekanand Shikshan Sanstha's
VIVEKANAND COLLEGE (Autonomous), KOLHAPUR

Class __BSc II__   Div _____   Roll No. __74917__

Suppllment No. _____   Subject __Astro-physics__

Test / Tutorial No. __Internal exam.__

Q.1)   Long answer questions (any one)

1) Derive the expression for equation of continuity in a three diamensions.

OR

2) Derive equation of motion and ideal fluid.

Q.2)   Short ans. question (any two)

1) What is galaxy? what are the type of galaxy?
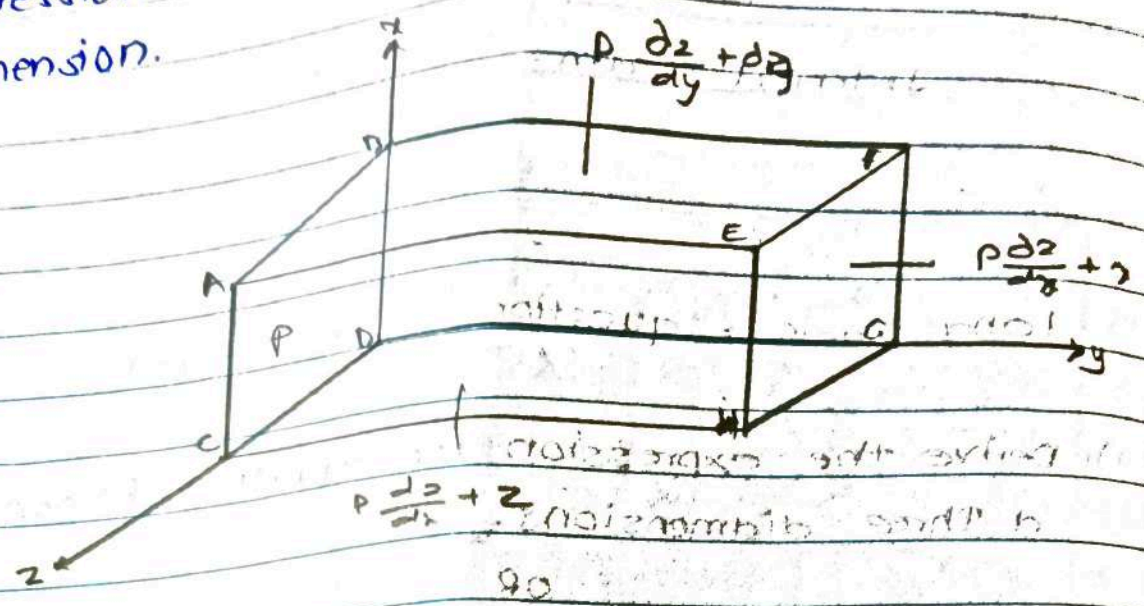
2) write a note on ceyftre galaxy?

3) write a note on comets?

Q.1) | 1) expression for the equation of continuty in Three diamension.

∴ from the shown diagram, are the expression for the continuty of three diamentions of mass.

∴ In diagram show the axis of x, y, z are the acauted $90°$ angle of each other. ① diagram $P\frac{\partial}{\partial z} + dz$ are the upper measured surface there are the three surface $P + \frac{\partial}{\partial x} + dx$ and ⓘⓘ $P\frac{\partial z}{\partial z} + dz$ are show in the figur

∴ The equation of continuty is based on the law of conservation of mass is based.

Mass of through a Fluid AB.

$$\frac{m}{s} = M \frac{gv}{s} \quad (as \ s = \frac{m}{v})$$

$$\therefore \qquad = \frac{SA \times \ell}{s}$$

$$\qquad = S \times A \times y \qquad \therefore \frac{\ell}{s} = v$$

$$\therefore \quad \rho \times u \times dy \times dz$$

$$= \rho x - u \times dy\,dz + \frac{\partial}{\partial x}$$

$$= \frac{-\partial}{\partial x} (\rho u \, dy\,dz)\, dx$$

$$= \frac{-\partial \rho}{\partial x} \, dx\,dy\,dz$$

$$= \frac{-\partial}{\partial y} \rho \, dx\,dy\,dz$$

$\therefore$ from this eqn. Rate increasing along the z-direction.

$$\therefore \quad = \frac{-\partial}{\partial z} (\rho u \, dx\,dy\,dz).$$

$$\therefore \quad \frac{-\partial}{\partial z} (\rho w \, dx\,dy\,dz).$$

$\therefore$ The total Rate increasing mass).

$$= \left[\frac{-\partial}{\partial x} (\rho u \, dx\,dy\,dz) + \frac{\partial}{\partial y} (\rho \, dx\,dy\,dz) - \frac{\partial}{\partial z} (\rho w \, dx\,dy\,dz) \right.$$

$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad — ①$$

fluid element $= \rho \, dx\,dy\,dz$

Increasing of mass $= \dfrac{\partial \rho}{\partial t} \, dx\,dy\,dz$ — ②

$\therefore$ Equating eqn. ① & ② we get,

$$\therefore \quad \rho \times u \times dy \times dz$$

$$= \rho x - u \times dy dz + \frac{\partial}{\partial x}$$

$$= \frac{-\partial}{\partial x} (\rho u \, dy \, dz) \, dx$$

$$= \frac{-\partial \rho}{\partial x} \, dx \, dy \, dz$$

$$= \frac{-\partial}{\partial y} \rho \, dx \, dy \, dz$$

$\therefore$ from this eqn. Rate increasing along the z-direction.

$$\therefore \quad = \frac{-\partial}{\partial z} (\rho u \, dx \, dy \, dz).$$

$$\therefore \quad \frac{-\partial}{\partial z} (\rho w \, dx \, dy \, dz).$$

$\therefore$ The total Rate increasing mass).

$$= \left[\frac{-\partial}{\partial x} (\rho u \, dx \, dy \, dz) + \frac{\partial}{\partial y} (\rho \, dx \, dy \, dz) - \frac{\partial}{\partial z} (\rho w \, dx \, dy \right.$$

$$\underline{\quad \quad \quad} \textcircled{1}$$

fluid element $= \rho \, dx \, dy \, dz$

Increasing of mass $= \frac{\partial R}{\partial t} \, dx \, dy \, dz$ $\quad$ —②

$\therefore$ Equating eqn. ① & ② we get,

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Signature of
Supervisor [ ]

Shri Swami Vivekanand Shikshan Sanstha's
VIVEKANAND COLLEGE (Autonomous), KOLHAPUR

Class __BSc II__   Div _____   Roll No. __7477__

Suppliment No. __1__   Subject __Astrophysiv__

Test / Tutorial No. __Internal exam__

**Q.1)**

1) Galaxy :-

The group of star called as the galaxy. The stars of the univers of not unfurmed distance between through the space they are contred by Attraekd into 109 galaxies, i.e. Osbivers contains galaxy the 10" star contained each other. that galaxy are called as the milky galaxy. the galaxy sepratete by very very large distance hubble.

The galaxy are classified into 4 Types.

① eliptical galaxy.
② spherical galaxy.
③ Barred spherical galaxy.

① Eliptical galaxy :-

O O O O O O O O O
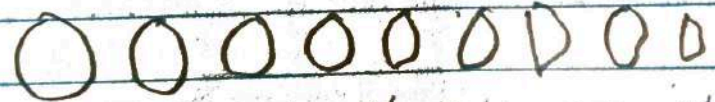
eliptical galaxy show the elips / sperical shape.