Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Physics

Notice

Date: Tuesday, 28th February 2025

All the students of B.Sc. – I are hereby informed that, Continuous Internal Evaluation CIE Examination is scheduled on 5th and 6th March 2025 in the Department of Physics at 10 AM.

Instructions:

1) Nature of question paper for B.Sc. – I: 02 MCQ's (02 Marks), 02 Short Answer Questions (04 Marks each), total = 10 Marks.
2) Students should present before 15 minutes of the examination.
3) Answer sheets will be provided by the Department.
4) Strictly mention the Full Name and Roll number on Answer Sheet correctly.
5) All students should remain present for the Internal Examination as the examination will not be conducted afterwords in any case.

Sr. No.	Date	Paper	Topic	Time
01	05/03/2025	III	Elasticity	10 – 11 AM
02	06/03/2025	IV	Electromagnetic Induction	10 – 11 AM

Head

HEAD
DEPARTMENT OF PHYSICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

"Education for Knowledge, Science and Culture"
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College (Empowered Autonomous), Kolhapur

Department of Physics

B.Sc.- I Internal Evaluation Examination, March – 2025

Subject Name: Paper – III (Properties of Matter); Chapter: Elasticity

Day and Date: Wednesday, 05th March 2025 Time: 10 – 11 AM Marks: 10

Students Attendance for Internal Evaluation Examination

Sr. No.	Name of the Student	Roll Number	Mobile Number	Signature
1)	Shreya Sachin Patil.	7332	7769849600	Patil
2)	Arishma Sachin Tripankar	7227	9405743057	
3)	Megha Sambhaji Patil	7223	7507943653	MSpatil
4)	Shivali Shivaji Kumbhar	7218	8080697990	
5)	Trupti D. Chougale	7201	7498048980	
6)	Swaleha. S. pathan	7338	7757861906	Swaleha.
7)	Vaishnavi S. Sawal.	7334	7038525176	
8)	Pratiksha Raju Mohite.	7251	7741835986	
9)	Sanika Shivaji Chougule	7213	7391952655	Schougule.
10)	Priti ketan Maruda	7221	8080252995	Pmaruda
11)	Amruta Vikrant Malawade	7220	8766837464	Amalawade.
12)	Purva Dhananjay chougale	7257	9325436212	
13)	Nandini Arun chorge	7323	8007542616	Nchorage.
14)	Mrunali Indrajit Kotmire	7216	9309183524	
15)	Samruddhi Krushnat Powar	7241	9322680018	
16)	Anushka Jingonda Patil	7245	7822979767	
17)	PRANALI RAMESH GAIKWAD	7244	8805750025	
18)	Prajwal sudhir Lokhande	7219	7030658232	
19)	Atharv Mahesh Salokhe	7208	9529467271	
20)	Arpita Bhikaji Patil	7330	9404114796	A.B.P.
21)	Shrushti satish chougule	7324	9561426445	S.S.C
22)	Vaishnavi Sandip chougale	7336	8888765565	V.chougale

VIVEKANAND COLLEGE KOLHAPUR ESTD JUNE 1964

	Name of Student	Roll No.	Mob. No.	Signature
23)	Parth. V. Patil	7224	8421664642	P.V. Patil
24)	Sahil Sachin Pachkattc	7222	6363491904	
25)	Pramod Prakash Khot	7370	9022233712	
26)	Abhay Nivas Patil	7531	9624931920	
27)	Mayuresh Amit Thunkikar	7204	8698061216	
28)	Mahesh Gawari	7203	9923179295	
29)	Harsh V. Pawar	7234	9657867291	Harsh
30)	Paras .P. Thokane	7243	7498332513	P Thokane
31)	Anushka B Powar	7262	9623063255	
32)	Sakshi .D. Sakhedkar	7263	8862072562	Sakhedkar
33)	Sanika S. Barade	7532	9021883113	
34)	Sakshi G. Chougule	7258	8080673829	
35)	Jiya S. Mulla	7261	7385271707	Jmulla
36)	Sai .S. Navale	7253	7588283875	
37)	Anuja .M. Matwadkar	7329	9226281407	
38)	Aditya. A. Dalavi	7325	8956119531	Dalavi
39)	Tejas.P. Patil	7254	9518590593	Patil
40)	Vinit N. Magdum	7249	9373977400	
41)	Mukund P. Mhetre	7260	9322959985	
42)	Shubham D. Davar	7259	9730290177	Davar
43)	Suraj. D. yelpale	7264	7387441436	
44)	Dinesh. D. Mane	7550	9075686416	
45)	Suyash . D. Ghugare	7327	9890339225	
46)	Shruti .A. Sutar.	7247	9423397891	S. A. Sutar.
47)	Samruddhi .S. Dixit	723	8788060990	SDixit
48)	Aditi Sandip Kumbhar	7225	9699412156	
49)	Diksha. V. Sutar	7251	8665103779	Diksha
50)	Nikhil K Methe	7238	8956829396	
51)	Samarth B. Koli	7236	9284968600	S. B. Koli

	Name of the Student	Roll No.	Mob. No.	Signature
52)	Yash Laxman Dhotre	7326	9372434544	Dhotre
53)	Ayan Shamshuddin Shaikh	7226	7821957974	A.S.S
54)	Shivam Pramod Bodake	7321	8484007493	
55)	Shivtej Vijay Patil	7339	8788275565	Patil.
56)	Pranav Dashrath Patil	7331	9960645026	Patil
57)	Rushi Umesh Pawar	7333	8788102726	Rushi.
58)	Shreyash Suhas Shingate	7335	8010736013	S.S.Shingate
59)	Atharva Rajaram Patil	7246	7083726060	
60)	Sajid Firoj mulla.	7231	8552041882	Sajid
61)	Abhishek. Sambhaji Parale.	7232	9689870495	
62)	Sahil Sunil kumbhar	7207	7057605310	Sahil
63)	Parth Prakash Gavali.	7202	7219737792	P. P.G
64)	Nikhil Sunil Salokhe	7209	7057708270	
65)	Harshvardhan. M. Kate	7206	9890900415	Hykate
66)	Adarsh Rakesh Jha	9214	9921876745	Adjha.
67)	Alpaj Ramjan patel	7266	9970653086	Alpatel.
68)	Shreeyash Shinde	7529	7972315157	
69)	AYYAN PATEL	7548	8668688652	
70)	Shreya Powar	7225	8421425311	Powar
71)	Ranjit Sachin Ghetge	7235	9371098670	
72)	Harshavardhan B. chavan	7322	7498796062	habchan
73)	Sarang. S. Zapate.	7228	9370469112	
74)				
75)				
76)				
77)				
78)				
79)				
80)				

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Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College (Empowered Autonomous), Kolhapur

Department of Physics

B.Sc.- I Internal Evaluation Examination, March – 2025

Subject Name: Paper – III (Properties of Matter); Chapter: Elasticity

Day and Date: Wednesday, 05th March 2025 Time: 10 – 11 AM Marks: 10

Q. 1: Select the correct Alternatives **(02)**

1) S. I. unit of Bulk Modulus (K) is .....
   a) Dyne/m^2 b) N/m^2 c) N/cm^2 d) kg/m^2

2) The ratio of change in ..... is called Tensile Strain.
   a) volume to original volume b) volumetric stress to volumetric strain
   c) length to original length d) area to original area

Q. 2: Answer the following Questions (Any Two) **(08)**

1) Determine Young's Modulus (Y) by Searles Method.
2) Give an expression for beam supported at both the ends.
3) Derive the expression for following two elastic constants;
   a) Young's Modulus and b) Bulk Modulus.

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

Name - Parth Prakash Gavali. Date :- 5/3/25

।। ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार ।।

- शिक्षणमहर्षी डॉ. बापूजी साळुंखे

27512

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

10/10

Signature of Supervisor	
Suppliment No. :	Subject : physics
Roll No. : 7202	Test / Tutorial No. :
Class : B.Sc FY	Div. :

Q.1

1]

→ b] N/m^2 01

2]

→ c] length to original length. 01

Q.2

3]

→ a] Young's Modulus (Y) :-

It is defined as the ratio of the logitudinal strees to the logitudinal strain.

$Y = \frac{\text{logitudinal strees}}{\text{logitudinal strain}}$

If $\vec{F}$ is the force applied normal to the surface area of A, then logitudinal strees = $\frac{\vec{F}}{A}$ and

logitudinal strain = $\frac{\Delta l}{l}$

∴ where l is original length and Δl is change in length.

∴ $\boxed{Y = \frac{\vec{F}/A}{\Delta l/l}}$

∴ If α is the logitudinal strain is per unit stress.

$\boxed{Y = \frac{1}{\alpha}}$ N/m^2

∴ The S.I unit of Young Modulus is N/m^2.

b] Bulk Modulus :-

It is defined as the ratio of the ~~logitudinal~~ volumetric stress to the volumetric strain.

It is denoted by 'K'.

$K = \frac{\text{volumetric stress}}{\text{volumetric strain}}$

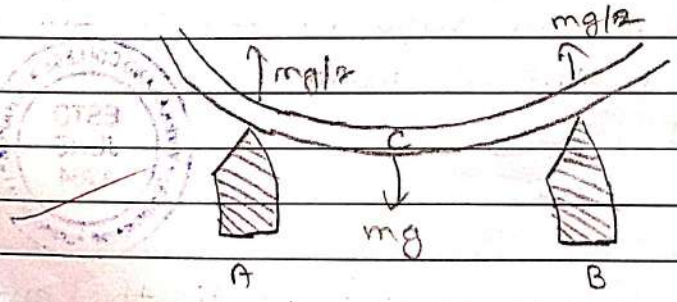
$\boxed{K = \frac{\vec{F}/A}{\Delta V/V}}$ ∴ $\boxed{K = \frac{\vec{F}/V}{A/\Delta V}}$

∴ where v is the original volume & Δv is the change in volume.

∴ The S.I unit of N/m^2.

04

3] Expression for beam supported at both the ends.



consider, 'A' bar is supported on a ~~two~~ two knife edges A & B.

~~there weight~~ The bar is bend on downward direction and there weight is to be mg at centre 'c' and two knife edges A & B in upward direction at weight mg/2.

The length of 'L' is a L/2

$$Y = \frac{mgL^3}{3Yak^2} \quad \text{---(1)}$$

from (1) A & B length L/2 & weight mg/2.

$$Y = \frac{(mg/2)(L/2)^3}{3Yak^2}$$

~~Put~~ Put $ak^2 = Ig$

$$Y = \frac{mgL}{48YIg}$$

case I :- Taking circular cross section of beam

$$Ig = \frac{\pi r^4}{4}$$

$$Y = \frac{mgL}{48YIg} \times \frac{\pi r^4}{4}$$

$$= \boxed{\frac{mgL}{12Y\pi r^4}}$$ — for circular cross section.

case II :- Taking reactangular cross section of beam. $Ig = \frac{bd^3}{12}$

$$Y = \frac{mgL}{48YIg} \times \frac{bd^3}{12}$$

$$\gamma = \frac{mg \cdot L}{4Y bd^3}$$ for rectangular cross section.

04

10

Name :- Harshvardhan M. Kate Date :- 5/3/25

।। ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार ।।

– शिक्षणमहर्षी डॉ. बापूजी साळुंखे 27515

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

10/10

Suppliment No. :

Roll No. : 7206

Class : BSc FY

Signature of Supervisor

Subject : physics

Test / Tutorial No. :

Div. :

Q1] 1] S.I. unit of Bulk modulus (K) is N/m^2.

2] The ratio of change in length to original length is called Tensile Strain.

Q2] Consider a wire of length 'l' and radius 'a' fixed to the middle points of the two ~~to~~ Similar and equal metal bars. The Bars may be Circular or rectangular Cross-Section. The Bars are Suspended to the rigid Support ~~of the~~ by the means of two vertical threads. Wire remains Straight and bars remains parallel to each other in fig given below.

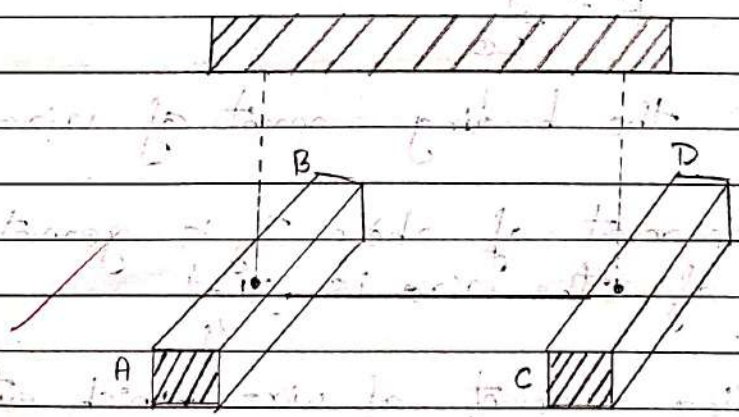
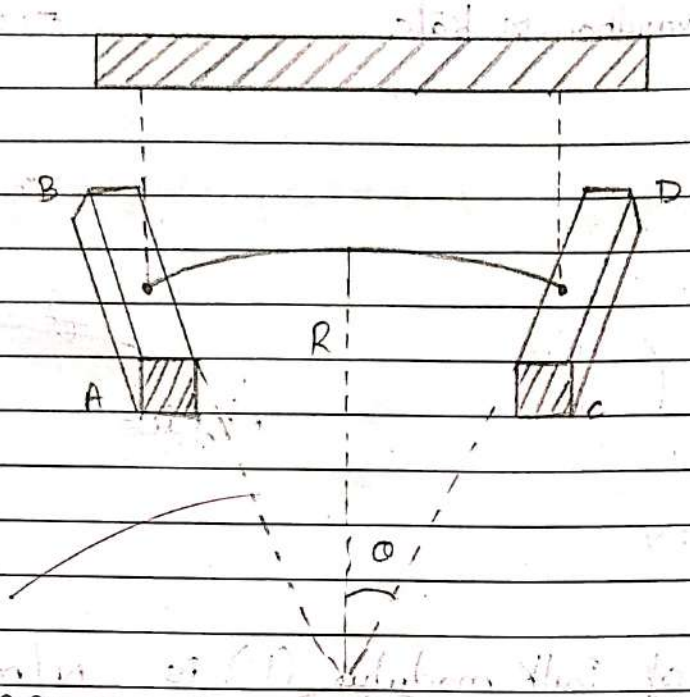


fig A :- Horizontal bar are at rest.



Let AB and CD are two bars. The ends of ~~E & D A & C~~ bars are ~~slightly~~ Slightly pulled together Symmetrically through a Small distance. The arise which bent is bent is of circular arc. If they are released, they begin to oscillate in the horizontal plane forming circular arc. It is due to the ~~torque~~ exterted by the wire on the bars.

If θ is a angle of deflection of each bar from its normal position, then angle is subtended by the wire at centre of curvature of the circular arc into which it is bent is 2θ. If R is radius of arc then $l = R \cdot 2\theta$.

$$\therefore R = \frac{l}{2\theta}$$

We know that the bending moment of wire is $\frac{Y I_g}{R}$

∴ ~~The bending moment~~ of where I_g is geometrical moment of interia of the wire is $\frac{\pi a^4}{4}$

∴ The Bending moment of wire which exterts couple on each bar is

$$\frac{Y I_g}{R} = \frac{Y \pi a^4}{4R} = \frac{Y \pi a^4 2\omega}{4L}$$

$$= \frac{Y \pi a^4 \omega}{2L} \quad \text{——(1)}$$

This couple produces angular acceleration ~~of~~ on each bar. If I is moment of inertia of each bar about an axis through its midpoint & perpendicular to ~~it~~ its length. ~~It is through the which is due to~~

Then at Equilibrium position

$$I \frac{d^2\omega}{dt^2} = -\frac{Y \pi a^4 \omega}{2L} \quad \text{——(2)}$$

where negative sign ~~indicates~~ is due to ~~bea~~ Bending moment acts as restoring couple.

$$\frac{d^2\omega}{dt^2} + \frac{Y \pi a^4 \omega}{2IL} = 0$$

This diff^n eq^n is angular Simple Harmonic motion Hence bars oscillate with angular S.H.M

$$\text{let } \omega^2 = \frac{Y \pi a^4 \omega}{2IL} \quad \text{——(3)}$$

$$\text{where, } \frac{d^2\omega}{dt^2} + \omega^2 \omega = 0$$

Time period of oscillation is

$$T_1 = \frac{2\pi}{\omega}$$

$$T_1 = 2\pi \sqrt{\frac{2IL}{Y \pi a^4 \omega}} \quad \text{——(4)}$$

Squaring eq^n (4) we get

$$T_1^2 = \frac{4\pi^2 \, 2IL}{Y \pi a^4 \omega}$$

$$Y = \frac{8\pi I L}{a^4 T^2} \quad \text{---(5)}$$

using Eq^n (5), young's modulus of material of wire can be determined.

3] a) Young's modulus :- It is the ratio of longitudinal stress ~~Strain~~ to the ~~longitudinal~~ lateral longitudinal strain. It is denoted by Y

$$Y = \frac{\vec{F}/A}{\Delta l / l}$$

where Δl = change in length

l = original length

If $\vec{F}$ is force acting normally to the surface area A then

$$Y = \frac{F/l}{A \Delta l}$$

If α is longitudinal strain per unit stress

$$Y = \frac{1}{\alpha}$$

It's S.I unit is N/m^2.

b) Bulk modulus :- It is the ratio of volumetric stress to the volumetric strain. Denoted by K.

$$K = \frac{\text{Volumetric stress}}{\text{volumetric strain}} = \frac{\vec{F}/A}{\Delta V / V} = \frac{\vec{F}/v}{A \Delta V}$$

where ΔV = change in volume

V = original volume.

It's S.I. unit is N/m^2.

Name :- Sahil sunil kumbhar date :- 05/03/2025

॥ ज्ञान, विज्ञान आणि सुसंस्कार मराठी शिक्षण प्रसार ॥

- शिक्षणमहर्षी डॉ. बापूजी साळुंखे

27511

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

10/10

Signature of Supervisor	

Suppliment No. : 1.

Roll No. : 7207

Class : BSC-FY

Subject : Physics / Elasticity

Test / Tutorial No. :

Div. : —

Q.1. 1. S.I. unit of Bulk Modulus (K) is N/m². (b) N/m² a)

2. The ratio of change in is Called Tensile (c) length to original length strain. a)

Q.2 3. a) Young's Modulus

It is defined as the ratio of longitudinal stress to the longitudinal strain. young's modulus denoted by (Y).

$$\frac{\text{longitudinal stress}}{\text{longitudinal strain}}$$

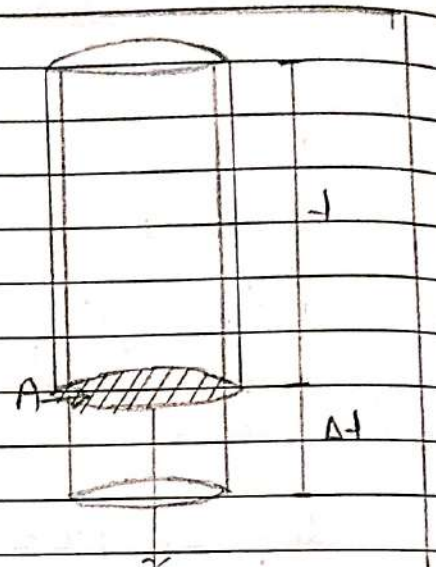
1

If the $\bar{F}$ is the ~~normal~~ force applied normal to the surface area of A. Then the longitudinal stress $\frac{\bar{F}}{A}$.

longitudinal stress = $\frac{\Delta l}{l}$

∴ where l is the original length and Δl is the change in length.

$$Y = \frac{\bar{F}/A}{\Delta l/l}$$



∴ l = original length
Δl = change in length

If the α is the longitudinal stain is per unit ~~area~~.

$$Y = \frac{1}{\alpha}$$

∴ The S.I unit of Young's modulus of N/m^2.

b] Bulk Modulus :-

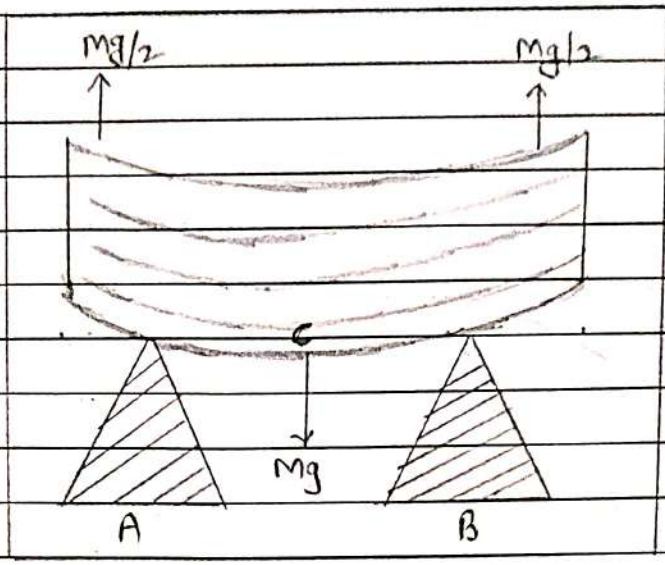
It is ~~if~~ defined as the ratio of Volumetric stress to the Volumetric stain. It is the Bulk modulus denoted by (K).

∴ Volumetric stress
Volumetric stain

$$K = \frac{\bar{F}/A}{\Delta V/V}$$

∴ The S.I unit of ~~young~~ bulk modulus of N/m^2.

Q.2.



Consider 'A' bar is supported on a two knife edges A and B.

The bar is the bend of the down ward direction and there weight is to be mg at centre 'C' and two knife edges A and B is upward direction of weight mg/2.

The length of l is a l/2.

$$y = \frac{mgl^3}{3Yak^2} \quad \text{---} (1)$$

from (1) A and B length l/2 and weight mg/2

$$y = \frac{(mg/2)(l/2)^3}{3Yak^2}$$

Put $ak^2 = Ig$

$$y = \frac{Mg.l}{48YIg}$$

Case 1 :- Taking circular cross section of beam

$$I_g = \frac{\pi r^4}{4}$$

$$y = \frac{Mg.l}{48yI_g} \times \frac{\pi r^4}{4}$$

$$= \boxed{\frac{Mg.l}{12y\pi r^4}} \quad \text{..... For circular cross section.}$$

Case 2 :- Taking rectangular cross section beam

$$I_g = \frac{bd^3}{12}$$

$$y = \frac{Mg.l}{48yI_g} \times \frac{bd^3}{12}$$

$$\boxed{y = \frac{Mgl}{4ybd^3}} \quad \text{.... For rectangular cross section.}$$

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Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College (Empowered Autonomous), Kolhapur

Department of Physics

B.Sc.- I Internal Evaluation Examination, March – 2025

Subject Name: Paper – IV (Electricity and Magnetism-II); Chapter: Electromagnetic Induction

Day and Date: Thursday, 06th March 2025 Time: 10 – 11 AM Marks: 10

Students Attendance for Internal Evaluation Examination

Sr. No.	Name of the Student	Roll Number	Mobile Number	Signature
1)	Sakshi . D . Sakhedkar	7263	8862072562	Sakhedkar
2)	Anushka Bhimrao Powar	7262	9623063255	Powar
3)	Sakshi . G. chougule	7258	8080673829	Chougule
4)	Diksha. V. Sutar	7256	9665103779	Diksha
5)	Anushka J. Patil	7245	7822979767	Patil
6)	Samruddhi K. Powar	7241	9322680018	Powar.
7)	PRANALI . R. GAIKWAD	7244	8805750025	Gaikwad.
8)	Yash · L· Dhotre	7326	9372434544	Dhotre
9)	Ayan . S. Shaikh	7226	7821957974	A.S.S
10)	Dinesh . D. Mane	7550	9075686416	Dmane.
11)	Mahesh Gawari	7203	9923179295	
12)	Mayuresh Amit Ghunkikar	7204	8698061216	
13)	Suraj . D. yelpale	7264	7387441436	S.D.
14)	Vinit N. Magdum	7249	9373979400	Vinit
15)	Mukund P. Mhetre	7260	9322959885	
16)	Shubham D. Pawar	7259	9730290177	Pawar
17)	Paras P. Thulkame	7243	7498332513	Thakare
18)	Tejas. P. Patil	7254	9518590593	Patil
19)	Sai . S. Naval	7253	7588283875	Sawale
20)	Jiya S. Mulla	7261	7385271707	Mulla.
21)	Sanika S. Barad	7532	9021883113	Barade
22)	Shrushti . S. Chougule	7324	9561426445	S.S.C

VIVEKANAND COLLEGE KOLHAPUR ESTD JUNE 1964

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23)	Harshvardhan. M. Kate	7206	9890900415	Hykate
24)	Sahil Sunil kumbhar	7207	7057605310	Sahil
25)	Parth Prakash Gavali.	7202	7219137792	P. P. G
26)	Nikhil Sunil salokhe	7209	7057708270	
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46)	Parth vinayak Patil	7224	8421664642	R.V.Patil
47)	Aditya Anandrao Dalavi	7325	8956119531	Dalavi
48)	Alpaj Ramjan pa	266	9970653086	ARpatel.
49)	Harsh V. Pawar	P234	9657867291	Harsh
50)	Prajwal Sudhir Lo	7219	7030658232	
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53)	Shivtej Vijay Patil.	7339	8788275565	S.Patil.
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55)	Atharv Mahesh Salokhe	7208	9529467271	
56)	Rushi Umesh Pawar	7333	8788102726	
57)	SHREYASH SUHAS SHINGATE	7335	8010736013	
58)	Atharva Rajaram Patil	7246	7083726060	
59)	Sajid Firoj Mulla.	7231	8552041882	
60)	AYYAN PARVEJ PATEL	7548	8668688652	
61)	Abhishek Sambhaji Parale	7232	9689570495	
62)	Vaishnavi Sandip Chougale	7336	8888765565	V. Chougale
63)	Anuja Mahadev Matoodkar	7329	9226281407	
64)	Vaishnavi Sachin Sawul.	7534	7038525176	
65)	Aditi Sandip Kumbhar.	7237	9699412156	
66)	Samruddhi. satya. Dixit	7230	7888060990	S Dixit
67)	Shruti Ananda Sutar.	7247	9423397891	S. A. Sutar.
68)	Arpita Bhikaji Patil	7330	9404114796	A. B. Patil
69)	Nikhil Krishnat Methe	7238	8956829396	
70)	Shreeyash Firoj Shinde	7529	7972315157	
71)	Ranjit Sachin Ghatge	7235	9371098670	
72)	Harshavardhan. B. Chavan	7322	7498746062	
73)	Sarang. S. Zapate	7228	9370469112	
74)				
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Vivekanand College, Kolhapur

(An Empowered Autonomous Institute)

B.Sc. Part-I (Sem-II) DSC-I- IV

Internal Examination Feb. 2025

Electricity and Magnetism- II Course Code: DSC03PHY22

Topic: Electromagnetic induction

Date: 06/02/2025

Time:10-11 AM

Marks: **10**

Q. 1 A) Select correct alternative. **(02)**

i. **What is the SI unit of magnetic flux?**

a) Weber (Wb) b) Tesla (T) c) Ampere (A) d) Henry (H)

2. **Who discovered electromagnetic induction?**

a) Albert Einstein b) Michael Faraday c) Nikola Tesla d) James Clerk Maxwell

Q.3) Short answer questions (Attempt any two) **(08)**

i. State Faraday's Law of Induction.
ii. Explain Self and Mutual Inductance.
iii. What is electromagnetic induction?

Trupti Dattatray chougale BSc IV. Sem II

॥ ज्ञान, विज्ञान आणि सुसंस्कार यासाठी शिक्षण प्रसार ॥
- शिक्षणमहर्षी डॉ. बापूजी साळुंखे

(अधिकारप्रदान स्वायत्त)
कोल्हापूर

VIVEKANAND COLLEGE, KOLHAPUR.
(Empowered Autonomous)

SUPPLIMENT

Jr. Supervisor's Sign. :	
Students Sign. :	
Seat No. :	7201
Seat No. in words :	
Suppliment No. :	10
	47010 10
Centre :	VCK

प्र. क्र. Q. No.		
Q.1	i)	a) Weber (Wb) The S.I unit of magnetic flux is Weber.
	ii)	b) Michael Faraday Michael Faraday was discovered the electromagnetic induction.

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02 Section	Q. No.													
	Marks													

प्र. क्र.
Q. No.

Q.2 Faraday's law of induction.

Faraday's first law-

The rate of change of magnetic flux is induced EMF. magnetic field

The number of lines passing through the circuit does not matter the value of induced EMF. Induced EMF is determined by the rate at which the magnetic flux changes

Faraday's second law-

The magnitude of induced EMF is equal to the rate of change of magnetic flux through the circuit.

Mathematically Faraday's second law expressed as,

Induced EMF $\propto$ Rate of change of magnetic flux.

$$e \propto \frac{d\phi_B}{dt}$$

$$\boxed{e = -\frac{d\phi_B}{dt}}$$

The negative sign in above expression indicate that the induced emf passing through the circuit

Section	Q. No.													03
	Marks													

प्र. क्र.
Q. No.

always opposses the magnetic flux passing through circuit.

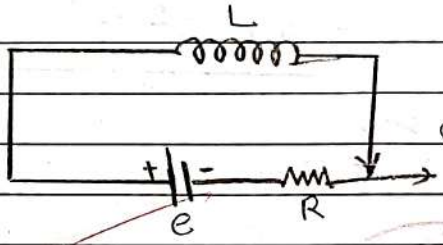
The induced emf for N-turns of coil.

$$e = -N\frac{d\phi_B}{dt}$$

04 Section Q. No. Marks

प्र. क्र. Q. No.

ii) (i) Self inductance -



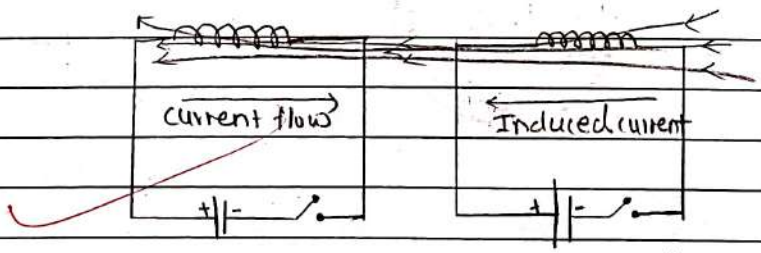
Phenomenon of producing induced emf in a circuit due to charge, as a self inductance

$$e = \frac{di}{dt}$$

Coefficient of self inductance is,

$$L = \frac{Nd}{i}$$

(ii) Mutual inductance - Phenomenon of producing an induced emf in a circuit due to charges in another circuit



$$M = \frac{N_2 \phi_2}{i_2}$$ → coefficient of mutual inductance

Name- Mahesh Gawari

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– शिक्षणमहर्षी डॉ. बापूजी साळुंखे

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VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor

10/10

Suppliment No. :

Roll No. : 7203

Class : B.S.C(FY)

Subject : Physics

Test / Tutorial No. :

Div. :

Q.1

i) What is SI unit of magnetic flux?

→ a) Weber (Wb)

ii) Who discovered electromagnetic induction?

→ b) Michael Faraday.

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Q. 3

1)

i) First law of

there one two types of Emf ~~is~~ namely

1) Faraday's first law

whenever amount of magnetic flux linked with a circuit changes and emf is induced magnetic flux in a circuit. Induced emf is unchanged.

2) Faraday's second law

A magnitude flux induced in a circuit is equal is the rate ~~in~~ of chang of magnetic flux.

Mathametically expressed by

$$e \propto \frac{d_2\phi}{dt}$$

$$e = \frac{d_2\phi_2}{dt}$$

$$e = \frac{-d_2\phi_B}{t_2 - t_1}$$

$$e = \frac{-d_2\phi_B}{-d_2 - t_1}$$

∴ The rate of change of magnetic flux is $e = \frac{-d_2\phi_B}{d_2 - t_1}$

3) →

Phenomeon of electromagnetic induction generting learnt to conditing

3)

i) The electromagnetic induction as A phenomeon of generting learnt in a conducting circuit (i) by changing of an assiociated external field.

i) In the emf thus developmed in the form of closed circuit it is called induced emf.

ii) Electromagnetic Induction is discovered by a michael faraday in 1831.

iii) A current flows in the circuit this the called induced circuit.

Name :- Mayuresh Amit Ghunkikar

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VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature of Supervisor	09/10

Suppliment No. :

Roll No. : 7204

Class : B.Sc. F.Y.

Subject :

Test / Tutorial No. :

Div. :

Q.1

i)

→ a) Weber (Wb)

ii)

→ b) Michael Faraday.

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Q.3

i)

→ There are two types of EMI Namely.

(1) Faraday's first law.

(1) Whenever a amount of magnetic flux linked with a circuit. changes & emf is induced magnetic flux in a Circuit.
induced emf is unchanged

2

(2) faraday's Second law

(1) A magnitude flux induced in a Circuit is equal to the rate of change of magnetic flux.

induced EMF $e \propto$ the rate of change of magnetic flux.

Mathematically expressed by

$e \propto$

$$e \propto \frac{d_2 \Phi}{dt}$$

$$e = \frac{d_2 \Phi_B}{dt}$$

$$e = -\frac{-d_2\Phi_B}{t_2 - t_1}$$

the rate of change of Magnetic flux is $e = \frac{d_2 - \Phi_B}{t_2 - t_1}$

Q.2

→ The electromagnetic induction is a phenomenon of generating in a Conducting Circuit by changing of an associated is Called as electromagnetic induction. It is Called as Electromagnetic induction.

The Characteristics of EMI

(1) in the ~~in EM~~ Electromagnetic induction thus developed is in the form of Closed in a circuit is Called as induced EMF

(2) the Electromagnetic induction was discovered by Michael Faraday in 1831

(3) A Current flows in a Circuit it is Called as induced EMF

3