

Vivekanand College, Kolhapur. (Autonomous)
Department of Physics
Internal Examination Notice
2018-19

Date:30/09/2018

All students of class B.Sc. I, B.Sc. II and B.Sc. III are hereby noticed that the first 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 2018-19.

SEM I, SEM III and SEM V

Time Table

Sr. No.	Class	Paper	Date	Time
1.	B.Sc. I	Paper I	11/10/2018	11:00 am to 12:00 pm
2.	B.Sc. II	Paper III	11/10/2018	11:00 am to 12:00 pm
3.	B.Sc. II (Astrophysics)	Paper I	12/10/2018	11:00 am to 12:00 pm
4.	B.Sc. III	Paper V (section I)	15/10/2018	11:00 am to 12:00 pm
		Paper V (section II)		01:00 am to 2:00 pm
		Paper VI (section I)	16/10/2018	11:00 am to 12:00 pm
		Paper VI (section II)		01:00 am to 2:00 pm




HOD
Head of the
Department of Physics
Vivekanand College, Kolhapur

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)

Internal Examination 2018-19

B.Sc. I, SEM- I PHYSICS-DSC -1001 A

Subject: Mechanics I & II

Time: 30 Minutes

Marks: 20

Q. 1. Long Answer Questions (Any one)

(10)

- 1) What is cantilever? Derive an expression for the depression of the free end of a cantilever due to a load.
- 2) Explain vector product and its characteristics in detail.

Q. 1. Short Answer Questions (Any two)

(10)

- 1) Define scalar and properties of scalar product.
- 2) Derive an expression for beam supported at both the ends.
- 3) Derive an expression for moment of inertia of irregular body.



Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur

(Autonomous)

Department of Physics

Internal exam

B.Sc.I Sem I

Date:- 11/10/2018

Attendance Sheet

Roll No	Name Of The Students	Signature
7501	Admuthe Vishal Vijay	<u>AVVishal</u>
7502	Bagwan Siddhika Jahidahmad	<u>Bagwan Siddhika</u>
7503	Bavache Dhananjay Kiran	<u>Bavache</u>
7504	Baygol Anil Parshuram	<u>Anil B</u>
7505	Benade Dhanashri Krushnat	<u>Dhanashri Benade</u>
7506	Bhoi Shraddha Annasaheb	<u>Shraddha Bhoi</u>
7507	Bhosale Sudhanshu Prakash	<u>S. H. Bosale</u>
7508	Bhure Prachi Chhagan	<u>P. C. Bhuje</u>
7509	Chaus Rijwan Shabbir	<u>R. Chaus</u>
7512	Bhosale Sohan Sanjay	<u>Bhosale</u>
7514	Gadgil Jyoti Bajirao	<u>J. Gadgil</u>
7515	Gaikwad Shradha Shankar	<u>S. Gaikwad</u>
7516	Gaikwad Apeksha Yashavant	<u>A. Gaikwad</u>
7517	Gangalmale Satpal Kerappa	<u>S. Gangalmale</u>
7518	Gavade Shivraj Vishnu	<u>Gavade</u>
7519	Gavali Santosh Vasudev	<u>Gavali</u>
7520	Ghatage Hrutik Avinash	<u>H. Ghatage</u>
7521	Ghule Shashani Nitin	<u>N. Ghule</u>
7522	Gokhale Makarand Mohan	<u>M. Gokhale</u>
7523	Gurav Rushikesh Balkrishna	<u>R. Gurav</u>
7524	Gurav Kedar Sadanand	<u>K. Gurav</u>
7525	Hundekari Vrushabh Sunil	<u>V. Hundekari</u>
7527	Kadam Rushikesh Balasaheb	<u>R. Kadam</u>
7528	Kadam Rutuja Vitthal	<u>R. Kadam</u>
7529	Kadam Moreshwar Ramchandra	<u>M. Kadam</u>
7530	Kadam Gouri Dattatray	<u>G. Kadam</u>
7531	Kamble Pratiksha Ananda	<u>P. Kamble</u>
7533	Kamble Akshata Prafull	<u>A. Kamble</u>
7534	Kamble Rasika Anil	<u>R. Kamble</u>
7535	Kamble Rushikesh Mallappa	<u>R. Kamble</u>
7536	Kashid Kedar Mohan	<u>K. Kashid</u>
7537	Katkar Priyanka Indrajit	<u>P. Katkar</u>



7538	Kazi Tabasum Arif	Kazi
7539	Kesarkar Prajakta Rajaram	Kesarkar
7540	Khade Aakanksha Harishchandra	Khade
7541	Khot Vaishnavi Nijappa	Khot
7542	Khot Sakshi Suresh	Khot
7543	Khot Soundarya Sanjay	Khot
7544	Khot Omkar Ramchandra	Khot
7545	Khot Sanmati Aannaso	Khot
7546	Khot Shubhangi Krishnat	Khot
7547	Kore Rutvik Deepak	Kore
7548	Nalawade Pallavi Uday	Nalawade
7549	Kumbhar Gaurav Dinkar	Kumbhar
7550	Londhe Shuvanee Bhimrao	Londhe
7551	Majgaonkar Shweta Pavan	Majgaonkar
7552	Malavi Sayali Gautam	Malavi
7553	Masute Manasi Uday	Masute
7554	Mhatugade Prajakata Sanjay	Mhatugade
7555	Mhetri Bhakti Sukumar	Mhetri
7556	Mulla Samiya Isak	Mulla
7557	Mulla Yasmin Nasaruddin	Mulla
7558	Naikawadi Firdaus Anjum	Naikawadi
7559	Powar Rushikesh Bhagavat	Powar
7560	Pachpund Vinayak Shahaji	Pachpund
7561	Parit Komal Rajkumar	Parit
7562	Parit Rutuja Bhagavan	Parit
7563	Patil Akanksha Ashok	Patil
7565	Patil Shraddha Pandurang	Patil
7566	Patil Ulka Bhagwan	Patil
7567	Patil Bhushan Rajaram	Patil
7568	Patil Pavan Ranjit	Patil
7569	Patil Pradnya Bhikaji	Patil
7570	Patil Dhanashree Shankar	Patil
7571	Pore Sainath Vijay	Pore
7573	Powar Prajkta Dashrath	Powar
7574	Pujari Priyanka Muttappa	Pujari
7575	Punde Trupti Ashok	Punde
7576	Punde Shrushti Ashok	Punde
7577	Punde Bhakti Ashok	Punde
7578	Sagavakar Sushama Sarjerao	Sagavakar
7579	Sasane Aishwarya Bhagvan	Sasane
7580	Sase Sapana Bharat	Sase
7581	Satpute Suraj Tukaram	Satpute
7582	Shaikh Yasin Samad	Shaikh
7584	Shinde Mayuri Arjun	Shinde
7585	Shinde Swapnil Sardar	Shinde
7586	Shinge Alisha Jagannath	Shinge
7587	Shinge Dnyanesh Prabhakar	Shinge



7588	Survanshi Shubhangi Sardar	SS
7589	Sutar Namrata Dashrath	Nsutae
7590	Swami Athrav Gajanan	AS
7591	Swami Shivani Subhash	Swami
7592	Thokale Rushikesh Dhanaji	Thokale
7593	Ulape Anuja Arun	Allape
7594	Upadhye Suyog Sagar	Suyog
7595	Vibhute Rutuja Santosh	Vibhute
7596	Wadear Anirudh Krshna	Anirudh
7597	Wadkar Rushikesh Dhondiram	Rushikesh
7598	Yamgar Rakesh Pandurang	Rakesh
7599	Ajarekar Prathamesh Bhaskar	Ajarekar
7600	Bachche Aomkar Prakash	Aomkar
7601	Bedagkar Gauri Rahul	G. Bedagkar
7602	Bhalbar Digvijay Sushant	Bhalbar
7603	Chandrekar Bhushan Vinodkumar	Chandrekar
7604	Chavan Ramchandra Ashok	Chavan
7605	Chougale Tejaswini Bajirao	Tejas
7606	Chougule Snehal Anil	Snehal
7607	Chougule Abhinandan Mahaveer	Abhinandan
7608	Dayama Abhishek Ashok	Abhishek
7609	Desai Sandesh Haridas	Sandesh
7610	Desai Vikram Jayaram	Vikram
7611	Desai Ashwini Amarsinh	A. Desai
7612	Dharaniya Jitendra Govindram	Dharaniya
7613	Dhonukshe Vinayak Dhanaji	Dhonukshe
7615	Gawade Vinayak Arjun	Gawade
7616	Gharale Karan Manohar	K. M. Gharale
7617	Ghorpade Sunil Uttam	Sunil
7618	Gole Gaurav Rajaram	Gole
7619	Golanddaj Mishab Pravej	Mishab
7620	Hiremath Seema Sharnayya	Seema
7621	Jadhav Nikhil Sandeep	Nikhil
7622	Jadhav Sanket Bajirao	Sanket
7623	Jadhav Rohit Namdev	Rohit
7624	Kadam Sainath Subhash	Sainath
7625	Kalgutkar Aakash Rajendra	Aakash
7626	Kamble Ashish Sunil	Ashish
7627	Kamble Nikhil Shashikant	Nikhil
7628	Kamble Amol Bhikaji	Amol
7629	Kamble Shivani Shankar	Shivani
7631	Kanade Priyanka Swatantryakumar	Priyanka
7632	Khandekar Sandip Sukumar	Sandip
7633	Khandekar Pooja Sanjay	Pooja
7634	Khatangale Shubhangi Prakash	Shubhangi
7635	Khot Akash Balaso	Akash
7636	Khude Gouri Angad	G. Khude



7637	Koravi Dhuraj Keraba	Dkora P.S. Kulkarni
7638	Kudalkar Prajakta Shivaji	Kulkarni
7639	Kulkarni Trupti Ravindra	Alad
7640	Lad Avadhut Shivaji	Patil
7641	Latthe Sammed Rajendra	Patil
7642	Lohar Sarjerao Ananda	Patil
7643	Lohar Rohan Tanaji	Rohar
7644	Magar Shwetali Subhash	Magar
7645	Magdum Aniket Sambhaji	Magdum
7646	Mahajan Yash Vikas	Mahajan
7647	Mali Anurag Pundlik	Patil
7648	Mankapure Parveen Mehamud	Patil
7649	Methe Kishori Prakash	Methe
7650	More Shubham Laxman	More
7651	Mukanawar Mahesh Gangadhar	Mahesh
7652	Mulani Subiha Husen	Mulani
7653	Mulla Moin Shoukat	Mulla
7654	Nadaf Wasim Shahjan	Nadaf
7655	Nimbalkar Vishwjeet Vitthal	V. Nimbalkar
7656	Padaval Vaibhav Sadashiv	Padaval
7657	Padwal Pratiksha Babasaheb	Padwal
7658	Pathan Ansar Ashapak	Pathan
7659	Patil Mandar Dnyandeo	Patil
7660	Patil Rutuja Bharat	R. Patil
7661	Patil Omkar Sanjay	Omkar
7663	Patil Jayanti Janaba	Patil
7664	Patil Rajat Jaywant	R. Patil
7665	Patil Anuja Dattajirao	Patil
7666	Patil Saurabh Ashok	S. Patil
7667	Patil Sanyogita Sanjay	S. Patil
7668	Patil Vijayraj Maruti	Patil
7669	Patil Akanksha Ashok	Patil
7670	Patil Sujay Subhash	Patil
7671	Patil Snehal Namdev	N. P.
7672	Patil Shilpa Shivaji	Patil
7673	Patil Shubham Dileep	Patil
7674	Patil Omkar Dhanaji	Omkar
7675	Patil Sankalp Vishvanath	Patil
7676	Patil Omkar Keshav	Patil
7677	Patil Aakansha Bhimarao	Patil
7678	Patil Divya Ramesh	Patil
7679	Patil Omkar Janaba	Omkar
7680	Pawar Aakash Anandrao	Pawar
7681	Phonde Vaishnavi Dinkar	Phonde
7682	Pirai Omkar Baban	Pirai
7683	Powar Mayuri Pandurang	Powar
7684	Powar Harshdeep Deepak	Powar



7685	Rane Rohit Ramdas	R Rane
7686	Sawant Aarti Ashok	A Sawant
7687	Sayyad Alsaba Javed	S Sayyad
7688	Shelar Avinash Sanjay	A Shelar
7689	Shinagare Bharat Shivaji	B Shinagare
7690	Singh Rohit Sanjay	R Singh
7691	Sonkamble Rohan Raju	R Sonkamble
7692	Sutar Deepak Vishvanath	D Sutar
7693	Ulape Nisha Palhad	N Ulape
7694	Ulape Manali Dattatray	M Ulape
7695	Valunj Amarja Digambar	A Valunj
7696	Velhal Vyankatesh Hemant	V Velhal
7697	Yadav Durga Vaijanath	D Yadav
7698	Bagwan Bebihafsa Rafik	B Bagwan
7699	Bansavade Omkar Devdas	B Bansavade
7700	Bendke Mukta Vikas	M Bendke
7701	Bhandari Pratiksha Kiran	P Bhandari
7702	Bhatale Sachin Sakharam	S Bhatale
7703	Bhosale Sneha Arun	S Bhosale
7704	Carvalho Alex Motes	A Carvalho
7705	Chavan Satish Rangrao	S Chavan
7706	Chokakkar Viraj Vijay	V Chokakkar
7707	Choudhary Ruchita Pralhadray	R Choudhary
7708	Chougale Priyanka Bajirao	P Chougale
7709	Chougale Rohit Rajendra	R Chougale
7711	Dabholkar Pratik Vijay	P Dabholkar
7712	Dalavi Pandurang Narayan	P Dalavi
7713	Devardekar Unmesha Sunil	U Devardekar
7714	Ekal Prathamesh Shivanand	P Ekal
7715	Gadade Jeevan Ankush	J Gadade
7716	Gaikwad Amrita Prakash	A Gaikwad
7717	Gavali Mansi Sunil	M Gavali
7718	Ghorpade Dattatray Vishnu	D Ghorpade
7719	Gotkhinde Shrutika Bharat	S Gotkhinde
7720	Jadhav Digvijay Suresh	D Jadhav
7721	Jangam Shivkrupa Pramod	S Jangam
7722	Kamble Mrunali Ramesh	M Kamble
7723	Kamble Snehal Balaso	S Kamble
7724	Kamble Digvijay Pandurang	D Kamble
7725	Kamble Pratiraj Prakash	P Kamble
7727	Karale Shubham Mansing	S Karale
7728	Kasar Siddhant Shashikant	S Kasar
7729	Kashidkar Kishor Balaso	K Kashidkar
7730	Kasture Yashdeep Anand	Y Kasture
7731	Khambe Manisha Madhukar	M Khambe
7732	Khatkale Prashant Prakash	P Khatkale
7734	Kodag Sneha Shivaji	S Kodag



7735	Koli Sayali Santosh	Sayali
7737	Kumbhar Akshay Dadaso	(K)
7738	Kumbhar Pratiksha Appaso	Kumbhar
7739	Londhe Pradnya Ashok	Londhe
7740	Marathe Kunal Sandeep	Mural
7741	Mardane Pratiksha Shrikant	P.S. Mardane
7742	Mote Ramesh Annappa	Mote
7743	Mullani Kashish Sameer	Mullani
7744	Nagarji Rahim Nurmahamad	Nagarji
7745	Nhavi Shivanand Balesh	Nhavi
7746	Nikam Sneha Bajarang	Nikam
7747	Nirmalkar Mayuri Chandrakant	Nirmalkar
7748	Paladiya Priyanka Shantilal	Paladiya
7749	Patharut Shubham Shrikant	Patharut
7750	Patil Sourabh Suhas	SSP
7751	Patil Shivani Dilip	Patil
7752	Patil Afanan Ashafak	Patil
7753	Patil Akanksha Dhanaji	A. D. Patil
7754	Patil Nishigandha Shahaji	Patil
7755	Patil Rutuja Bhanudas	Patil
7756	Patil Akshata Ravindra	Patil
7757	Patil Nandini Sunil	Patil
7758	Patil Rushikesh Eknath	Patil
7759	Patil Rushikesh Vishwas	Patil
7760	Patil Shivali Balaso	Patil
7761	Patil Tejal Tanaji	Patil
7762	Patil Saurabh Dinkar	Patil
7764	Patil Mayuri Tukaram	Patil
7765	Pawar Pratiksha Ramesh	Pawar
7766	Pawar Sumit Sanjay	Sumit
7767	Powar Supriya Madhukar	Powar
7768	Powar Vaishnavi Shankar	U.S.P.
7769	Powar Kareena Sunil	Powar
7770	Raghani Ritik Dinesh	Raghani
7771	Ramsing Bhagyashri Shamrao	Ramsing
7772	Rathod Pramod Ramesh	Rathod
7773	Sabale Abhishek Dattatray	Sabale
7774	Sajnikar Divya Netaji	Sajnikar
7775	Sankpal Prajakta Bajirao	Sankpal
7776	Sardesai Rutuja Rahul	Sardesai
7777	Savant Komal Anil	Savant
7778	Sharma Ankita Raviraj	Sharma
7779	Shinde Rutuja Sunil	Shinde
7780	Shinde Prajakta Ramchandra	Shinde
7782	Shinde Dhanashri Dadaso	Shinde
7783	Shinde Neha Dattatray	Shinde
7784	Shinde Abhishek Vilas	Shinde



7785	Shinde Abhijeet Vilas	Shinde
7786	Shinde Manisha Appasaheb	Shinde
7787	Shirale Sayali Rajendra	Sayali
7788	Suryavanshi Smital Jaysingrao	Smital
7789	Talekar Prathmesh Sambhaji	Talekar
7790	Tandale Purva Shirish	Tandale
7791	Ubale Akanksha Kumar	Ubale
7792	Vadgave Sakshi Shamsundar	Vadgave
7859	Jangate Ajit Sukumar	Jangate
7860	Kadam Archiet Chandrakant	Kadam
7861	Kamble Tejashri Sambhaji	Kamble
7862	Kamble Rahul Deepak	Kamble
7863	Koundade Shubham Ravindra	Shubham
7864	Mahajan Sakshi Anil	Mahajan
7865	Patil Shivam Baliram	Patil
7866	Patil Rohan Ashok	Patil
7867	Patil Shubham Sanjaykumar	Patil
7868	Patil Sammed Rajgonda	Patil
7869	Patil Pooja Ravalu	Patil
7870	Patil Vaishnavi Dashrath	Patil
7871	Pawar Aishwarya Chandrakant	Pawar
7872	Powar Prashant Vishal	Powar
7873	Salunkhe Kalyani Sanjay	Salunkhe
7874	Sawant Bhakti Arun	Sawant
7875	Shaikh Muskan Mohiddin	Shaikh
7877	Shinde Pratik Chandrakant	Shinde
7878	Sutar Vishwajeet Ganesh	Sutar
7879	Yadav Saiprasad Shrinivas	Yadav
7880	Yamgarnikar Snehal Nitin	Yamgarnikar
7881	Baganikar Sanket Suhas	Baganikar
7882	Chougale Niranjane Nandkumar	Chougale
7883	Chougale Shubham Pandurang	Chougale
7884	Ghotane Sagar Umesh	Ghotane
7885	Hande Rutuja Raju	Hande
7886	Hegade Vaishnavi Kiran	Hegade
7887	Kamble Prajakta Sundar	Kamble
7888	Kamble Yash Balu	Kamble
7889	Kamble Shubhangi Prakash	Kamble
7890	Karoshi Spurthi Mallikarjun	Karoshi
7891	Kharade Nisha Narayan	Kharade
7893	Nille Aishwarya Sachin	Nille
7894	Nimbalkar Manasi Arun	Nimbalkar
7895	Pathare Akshata Nitin	Pathare
7896	Patil Snehal Vilas	Patil
7897	Patil Amruta Amar	Patil
7898	Patil Shivam Rajendra	Patil
7899	Patil Vinod Vijay	Patil



7900	Patil Gautam Yashwantrao	Patil
7901	Sasne Rutvik Sambhaji	Rutvik
7902	Shete Aditi Sunil	Aditi S
7904	Todkar Sharvari Sanjay	Sharvari
7905	Urane Rachana Raju	Rachana
7906	Valvi Rajendra Ravidas	Rajendra
7907	Yadav Rutuja Deepak	Rutuja
7908	Patil Shritej Subhash	Shritej
7909	Patil Abhishek Sanjay	Abhishek
7910	Sasawade Shivani Bhikaji	Shivani
7911	Gurav Rutuja Ravindra	Rutuja
7912	Sawant Swati Ajit	Swati
7914	Gurav Akshay Sambhaji	Akshay
7915	Kumbhar Pranoti Sunil	Pranoti
7916	Patil Nisha Bharat	Nisha
7917	Magdum Harshvardhan Rajkumar	Harshvardhan
7918	Kesarkar Abhishek Narsingrao	Abhishek
7919	Patil Sohan Ramesh	Sohan
7920	Kalugade Sourabh Ravindra	Sourabh
7921	Adkurkar Supriya Balu	Supriya
7922	Sawant Rohini Vitthal	Rohini
7923	More Rutuja Bajirao	Rutuja
7924	Chavan Siddhi Milind	Siddhi
7925	Amate Punam Vitthal	Punam
7926	Bharmal Pritam Prabhakar	Pritam

Internal Examiner.....

(Dr. M. M. Karanjkar)



॥ ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार ॥

- शिक्षणमहर्षी डॉ. बापूजी साळुंखे

34013

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

Signature
of
Supervisor

Suppliment No. :

Roll No. : 7534

Class : B.Sc-I, Sem-I (18-19)

Subject : Mechanics I, II

Test / Tutorial No. : Internal Exam

Div. :

15
20

2. Vector product and its characteristics in detail.

→ Defⁿ → A vector is an object that has both the direction and magnitude.

i) Vector product two vector is always a vector.

ii) The vector product of two vectors is non-commutative i.e.
 $\vec{a} \cdot \vec{b} \neq \vec{b} \cdot \vec{a}$ but $\vec{a} \cdot \vec{b} = -\vec{b} \cdot \vec{a}$.

iii) Vector product obeys the distributive law of multiplication
 $\vec{a} \times (\vec{b} + \vec{c}) = \vec{a} \times \vec{b} + \vec{a} \times \vec{c}$

iv) If $\vec{a} \cdot \vec{b} = 0$ and $\vec{a} \neq 0$, $\vec{b} \neq 0$ then the two vectors, then their vector product is given by,

$$\vec{a} \times \vec{b} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ a_x & a_y & a_z \\ b_x & b_y & b_z \end{vmatrix}$$



Q.23) Scalar.

i) A physical quantity that is completely described by its magnitude.

Scalar product properties.

ii) The product quantity $\vec{A} \cdot \vec{B}$ is always scalar.

iii) Scalar product is commutative $\vec{A} \cdot \vec{B} = \vec{B} \cdot \vec{A}$

iv) The vectors obey distributive law

$$\vec{A} \cdot (\vec{B} + \vec{C}) = \vec{A} \cdot \vec{B} + \vec{A} \cdot \vec{C}$$

v) The angle between vectors

$$\theta = \cos^{-1} \left[\frac{\vec{A} \cdot \vec{B}}{AB} \right]$$

vi) The scalar product of two vectors will be maximum when $\cos \theta = 1$ i.e. $\theta = 0^\circ$ when the vectors are parallel.

vii) If two vectors \vec{A} & \vec{B} are perpendicular to each other then their scalar product $\vec{A} \cdot \vec{B} = 0$, because $\cos 90^\circ = 0$

viii) Every scalar quantity is one dimensional.

ix) Examples of scalar quantity

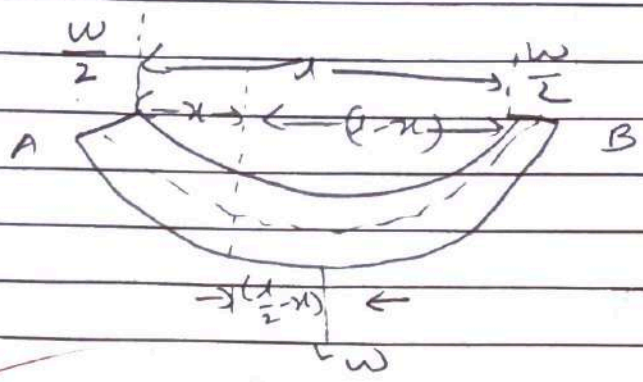
Eg.- length, mass, energy density.

x) Any change in scalar quantity is the reflection of change in magnitude.



Q:2)

2)



Let, l be the length of the cantilever.
 weight of beam supposed to be negligible, if the rod is loaded at the centre with a load w , then the R_x at each support will be $w/2$ in the upward direction.

$$\frac{YI_g}{R} = w\left(\frac{l}{2} - x\right) - \frac{w}{2}(l-x)$$

$$\frac{YI_g}{R} = \frac{-w}{x} \Rightarrow \frac{1}{R} = \frac{YI_g}{2} \Rightarrow \frac{1}{R} = \frac{-wx}{2YI_g}$$

$$\frac{1}{R} = \frac{d^2y}{dx^2} = \frac{-wx}{2YI_g}$$

Integrating w.r. to x ,
 $\frac{dy}{dx} = \frac{-w}{2YI_g} \int x dx + c_1$

$$\frac{dy}{dx} = \frac{-w}{2YI_g} \frac{x^2}{2} + c_1$$

Now at $x = \frac{l}{2}$, $\frac{dy}{dx} = 0$

$$0 = \frac{-w}{2YI_g} \frac{l^2}{2 \times 4} + c_1$$

$$c_1 = \frac{wl^2}{16YI_g} \quad \text{Hence, } \frac{dy}{dx} = \frac{-w}{2YI_g} \frac{x^2}{2} + \frac{wl^2}{16YI_g}$$



VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPLIMENT

Signature
of
Supervisor

Subject: Mechanics I, II

Test / Tutorial No.: Internal Exam

Div.:

Suppliment No.:

Roll No. : 7504

Class : B.Sc-I, Sem-I (18-19)

Q1.

2. Vector product and its characteristic in detail

Defⁿ - A vector is an object that has both the direction and magnitude.

(i). Vector product two vector is always a vector

(ii) The vector product of two vectors is non-commutative i.e. $\vec{a} \cdot \vec{b} \neq \vec{b} \cdot \vec{a}$ but $\vec{a} \cdot \vec{b} = -\vec{b} \cdot \vec{a}$

iii Vector product obeys the distributive law of multiplication

$$\vec{a} \times (\vec{b} + \vec{c}) = \vec{a} \times \vec{b} + \vec{a} \times \vec{c}$$

iv. If $\vec{a} \cdot \vec{b} = 0$ and $a \neq 0$, $b \neq 0$ then the two vectors are parallel to each other.

v. If $\vec{a} = a_x \hat{i} + a_y \hat{j} + a_z \hat{k}$ and $\vec{b} = b_x \hat{i} + b_y \hat{j} + b_z \hat{k}$ are the two vectors, then their vector product is given by,



$$\vec{a} \times \vec{b} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ a_x & a_y & a_z \\ b_x & b_y & b_z \end{vmatrix}$$

Q2 Scalar

A physical quantity that is completely described by its magnitude

Scalar product properties

(i). The product quantity $\vec{A} \cdot \vec{B}$ is always scalar.

(ii) Scalar product is commutative $\vec{A} \cdot \vec{B} = \vec{B} \cdot \vec{A}$

(iii). The vectors obey distributive law
 $\vec{A} \cdot (\vec{B} + \vec{C}) = \vec{A} \cdot \vec{B} + \vec{A} \cdot \vec{C}$

iv. The angle between vectors

$$\theta = \cos^{-1} \left[\frac{\vec{A} \cdot \vec{B}}{AB} \right]$$

v. The scalar product of two vectors will be maximum when $\cos \theta = 1$ i.e. $\theta = 0^\circ$ when the vectors are parallel.

(vi) If two vectors \vec{A} & \vec{B} are \perp to each other then their scalar product $\vec{A} \cdot \vec{B} = 0$, because $\cos 90^\circ = 0$

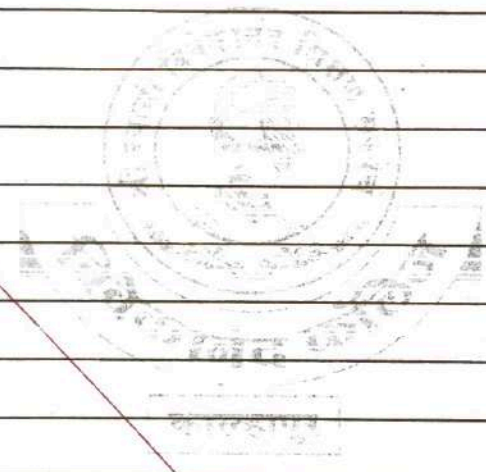


Q2.

(i) (vii) Every Scalar quantity is One dimensional

(viii) Examples of Scalar quantity
E.g - length, mass, energy density

(ix) Any change in Scalar quantity is the reflection of change in magnitude.



Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)**SUPPLIMENT**Signature
of
Supervisor

Suppliment No. :

Roll No. : 7667

Class : B.Sc-I, Sem-I (18-19)

Subject : Mechanics I, II

Test / Tutorial No. : Internal Exam

Div. :

Q. 1)

2. Vector product and its characteristic in detail.

→ Defⁿ - A vector is an object that has both the direction & magnitude.

i) Vector product two vector is always a vector.

ii) The vector product of two vectors is non-commutative i.e.
 $\vec{a} \cdot \vec{b} \neq \vec{b} \cdot \vec{a}$ but $\vec{a} \cdot \vec{b} = + \vec{b} \cdot \vec{a}$

iii) Vector product obeys the distributive law of multiplication
 $\vec{a} \times (\vec{b} + \vec{c}) = \vec{a} \times \vec{b} + \vec{a} \times \vec{c}$

iv) If $\vec{a} \cdot \vec{b} = 0$ and $\vec{a} \neq 0, \vec{b} \neq 0$, then the two vectors, then their vector product is given by,

$$\vec{a} \times \vec{b} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ a_x & a_y & a_z \\ b_x & b_y & b_z \end{vmatrix}$$



Q.2) Scalar

1 A physical quantity that is completely described by its magnitude

Scalar product properties

i) The product quantity $\vec{A} \cdot \vec{B}$ is always scalar.

ii) Scalar product is commutative $\vec{A} \cdot \vec{B} = \vec{B} \cdot \vec{A}$

iii) The vectors obey distributive law

$$\vec{A} \cdot (\vec{B} + \vec{C}) = \vec{A} \cdot \vec{B} + \vec{A} \cdot \vec{C}$$

iv) The angle between vectors

$$\theta = \cos^{-1} \left[\frac{\vec{A} \cdot \vec{B}}{AB} \right]$$

v) The scalar product of two vectors will be maximum when

$\cos \theta = 1$ i.e. $\theta = 0^\circ$ when the vectors are parallel.

vi) IF two vectors \vec{A} & \vec{B} are perpendicular to each other then their scalar product $\vec{A} \cdot \vec{B} = 0$, because $\cos 90^\circ = 0$

vii) Every scalar quantity is one dimensional

viii) Examples of scalar quantity

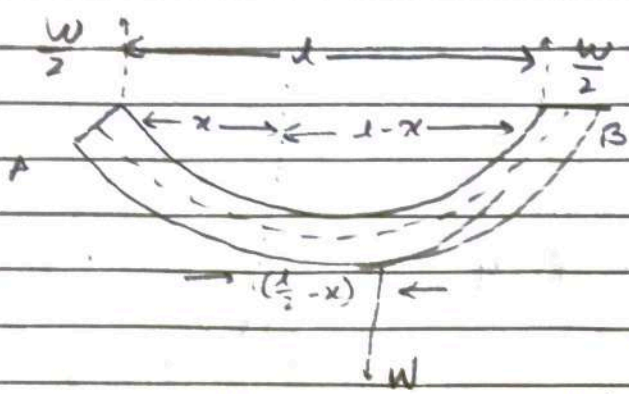
Eg- Length, mass, energy density.

ix) Any change in scalar quantity is the reflection of change in magnitude.



Q.27

⇒



Let l be the length of the cantilever.
 weight of beam supposed to be negligible, if the rod is loaded at the centre with a load W , then the R_x at each support will be $W/2$ in the upward direction.

$$\frac{Y I_g}{R} = W \left(\frac{l}{2} - x \right) - \frac{W}{2} (l-x)$$

$$\frac{Y I_g}{R} = -\frac{Wx}{2} \Rightarrow \frac{1}{R} = \frac{Y I_g}{2} \Rightarrow \frac{1}{R} = -\frac{Wx}{2YI_g}$$

$$\frac{1}{R} = \frac{d^2y}{dx^2} = -\frac{Wx}{2YI_g}$$

Integrating w.r. to x ,

$$\frac{dy}{dx} = \frac{-W}{2YI_g} \int x dx + C_1$$

$$\frac{dy}{dx} = \frac{-W}{2YI_g} \frac{x^2}{2} + C_1$$

Now at $x = \frac{l}{2}$, $\frac{dy}{dx} = 0$

$$0 = \frac{-W}{2YI_g} \frac{l^2}{2 \times 4} + C_1$$

$$\therefore C_1 = \frac{Wl^2}{16YI_g}$$

Hence, $\frac{dy}{dx} = \frac{-W}{2YI_g} \frac{x^2}{2} + \frac{Wl^2}{16YI_g}$

