



**PIMPRI CHINCHWAD UNIVERSITY**  
(Established Under Govt. of Maharashtra Act No. V of 2023)  
Sate, Maval (PMRDA) Dist: Pune Maharashtra – 412106



Program : FY B.Tech (CSE/AIIML/AIDS)

Batch : 2023-20224

Semester : II

Course : Basic Electronics Engineering

Course Code : ELT101

Day : Wednesday

Maximum Marks : 20 marks

Date : 20/03/2024

Time : 1 hr

**Instructions :**

- \_ All questions are compulsory
- \_ Assume suitable data wherever necessary

Question	CO	K level	Marks
<b>Q.1 Attempt any one</b>			
a) Prove that $V_o = -(R_f/R_1) V_{in}$ with diagram. Calculate $V_o$ if $R_1 = 2K\Omega$ , $R_f = 200K\Omega$ and $V_{in} = 2.5 mV$	CO3	5	10
b) Explain the op-amp as Integrator and Differentiator with diagram.	CO3	2	10
<b>Q.2 Attempt any one</b>			
a) Which transducer is used for measurement of Linear displacement and explain in details.	CO4	1	10
b) Draw a block diagram of Transducer /Sensor. Classify the type of transducer and explain each.	CO4	4	10



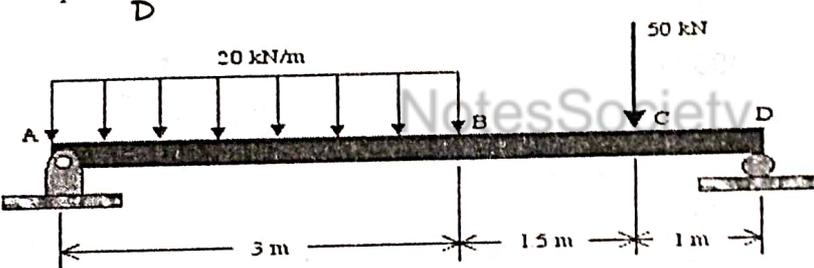
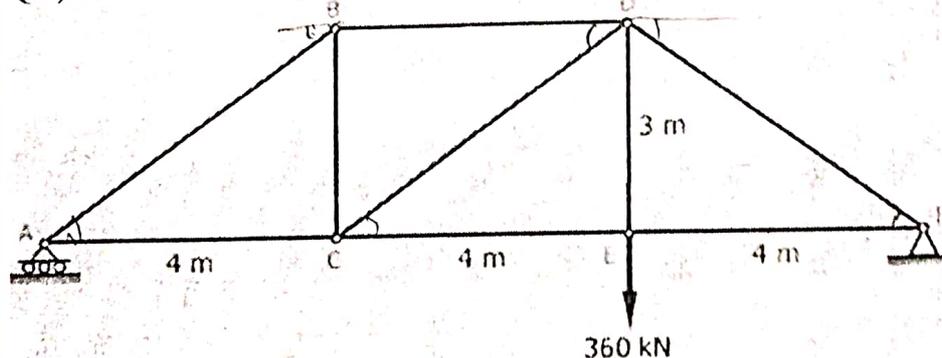
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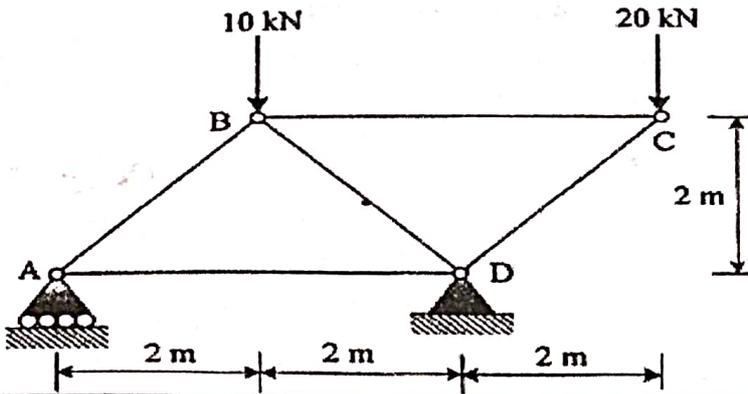
Program : FY Engineering  
 Batch : 2023-27  
 Semester : II  
 Course : Engg. Mechanics & Civil Engg.  
 Course Code : CM101  
 Day : Friday  
 Date : 22/3/2023

Maximum marks :20 marks  
 Time : 1 hr

**Instructions: Solve Any 3 Questions**

Question	CO	K level	Marks
Q.1) Determine the Support reactions at point A & D. point A have Hinge Suppot & point D Have Roller Support. 	CO2	3	6
Q.2) Determine the Reactions in all the members. 	CO3	3	7
Q.3) A ball is Projected Vertically upward with velocity 9.81 m/s. Find the max. Height travels by ball, velocity at which it strikes the ground and total time of journey.	CO3	4	6
Q.4) The position of the particle is defined by $X=t^3-6t^2+9t+5$ . Compute : a) the time when velocity is zero b) At $t=5s$ . find the position and acceleration	CO3	4	6

Q.5) Determine support reaction and find the forces in magnitude and direction of the members AD, BD and BC of the simply supported truss as shown in Fig. by method of section. Tabulate the result with magnitude and nature of force in the members.

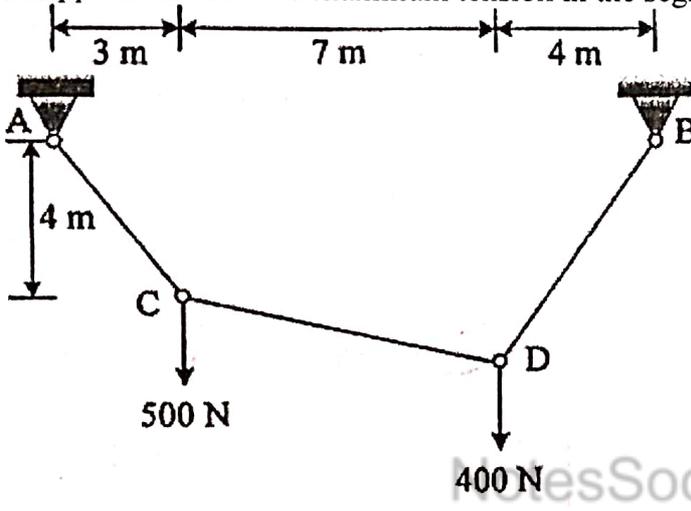


CO3

3

6

Q.6) The cable segment support the loading as shown in Fig. 6(a). Determine the support reaction and maximum tension in the segment of cable.



CO2

4

7

NotesSociety



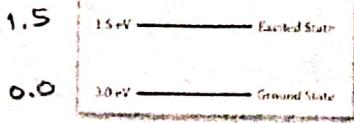
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Program : B. Tech  
Batch :  
Semester : II  
Course : Engineering Physics  
Course Code : PHY101  
Day : Thursday Maximum marks: 20 marks  
Date : 21 March 2024 Time: 1 hr

**Instructions:**

- Solve Q1 or Q2 & Q3 or Q4

<b>Q 1</b>	<i>All questions are compulsory.</i>	<b>Marks -10</b>
a)	Differentiate the conductor, semiconductor, and insulator on the basis of the energy band diagram.	(Marks -5) [CO2], KL-4
b)	The band gap energy for silicon photodiode is 1.1 eV. What is the wavelength of the light emitted by the LED?	(Marks -5) [CO2], KL-3
<b>OR</b>		
<b>Q 2</b>	<i>All questions are compulsory.</i>	<b>Marks -10</b>
a)	What is the coordination number and packing fraction of SC, FCC, and BCC crystal structures?	(Marks -5) [CO2], KL-3
b)	Define the fill factor of the solar cell and draw the I-V characteristics of the solar cell.	(Marks -5) [CO2], KL-2
<b>Q 3</b>	<i>All questions are compulsory.</i>	<b>Marks -10</b>
a)	Differentiate between coherent and incoherent sources of light with examples.	(Marks -5) [CO3], KL-4
b)	The wavelength of the He-Ne laser is 6328 Angstrom. Determine the energy of the photon.	(Marks -5) [CO3], KL-3
<b>OR</b>		
<b>Q 4</b>	<i>All questions are compulsory.</i>	<b>Marks -10</b>
a)	What is absorption, spontaneous emission, and stimulated Emission?	(Marks -5) [CO3], KL-2
b)	What is the frequency of a photon to excite an atom from the ground state to the excited state?  	(Marks -5) [CO3], KL-3



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Program	:	First Year B. Tech. (All)	
Batch	:	2023-27	
Semester	:	II	Unit Test: 2
Course	:	Integral Calculus and Numerical Technique	
Course Code	:	MTH 102	
Day	:	Monday	Maximum Marks: 20
Date	:	18-03-2024	Time: 1 hr.

**Instructions:**

1. All questions are compulsory.
2. Assume suitable and necessary data wherever required.

Q. No	QUESTION	BTL	CO	Max Marks
Q. 1.	Solve any Two			[10]
a) ✓	Evaluate $\iint_R xy \, dy \, dx$ over the area bounded by $y = x^2$ and $y = 2x$	BTL3	CO3	5
b)	Find the area over the positive quadrant of circle $x^2 + y^2 = a^2$	BTL3	CO3	5
c) ✓	Evaluate $\int_0^1 dy \int_{y^2}^1 dx \int_0^{1-x} x \, dz$	BTL3	CO3	5
Q. 2.	Solve any Two			[10]
a) ✓	Find the angle between the tangents to the curve $x = t, y = t^2, z = t^3$ at $t = 1$ and $t = -1$	BTL3	CO4	5
b) ✓	Find the directional derivative of $\phi = xy + yz + zx$ at the point $P(1, 2, 3)$ in the direction of the line PQ where $Q(3, -1, -3)$ .	BTL3	CO4	5
c) ✓	Show that the vector field $\vec{F} = (6xy + z^3)\vec{i} + (3x^2 - z)\vec{j} + (3xz^2 - y)\vec{k}$ is irrotational. Also find $\phi$ such that $\vec{F} = \nabla\phi$ .	BTL3	CO4	5

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