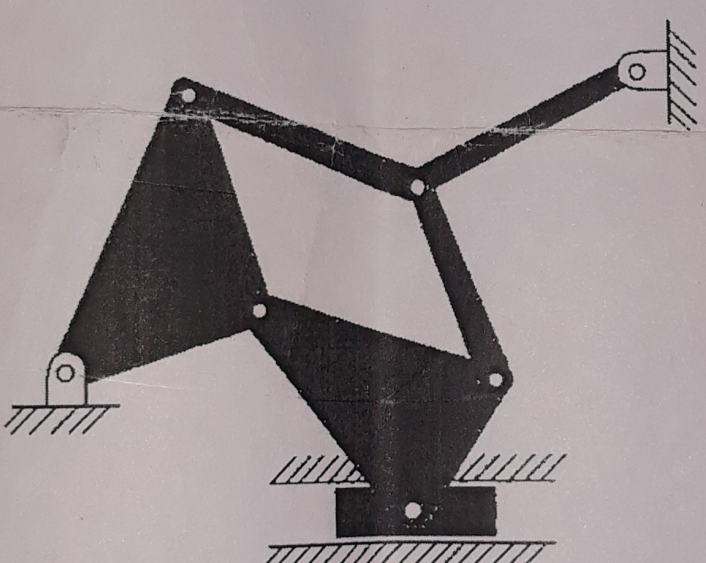




Continuous Assessment Test I – February 2024

Programme	: B. Tech (ECE/ECM)	Semester	: WS 2023-24
Course	: Robotics and Automation	Code	: BECE312L TH
Faculty	: Velmathi G, Anita Christaline. J.	Class Nbr	: C112023240502751, C112023240502749
Time	: 90 Minutes	Slot	: F1+TF1
		Max. Marks	: 50

Answer ALL the questions

Q.No.	Sub. Sec.	Questions	Marks
1.		<p>For the given robotic structure, find the degree of freedom. Give the step-by-step procedure involved in arriving at the value.</p> 	7
2.		<p>As robotics continues to evolve, what are the key considerations and challenges in designing a versatile robotic system capable of adapting to various terrains and performing a wide array of tasks? [2 marks]</p> <p>Explore the atleast two trade-offs involved in designing robots for specific applications versus creating modular, adaptable systems. [2 marks]</p>	8

	<p>Analyze the critical role of mobility mechanisms, sensor integration, and decision-making algorithms in enhancing a robot's performance across different terrains. [2 marks]</p> <p>Furthermore, discuss atleast two ethical implications of deploying robots in various sectors and how the design choices made in creating these systems impact their societal integration and acceptance. [2 marks]</p>	
3.	Calculate the number of steps required by a stepper motor to complete 20 revolutions with a step angle of 5° . Mention the suitable formulae to be used and the steps involved in this calculation.	5
4.	<p>You are tasked to bend metal sheets into specific angles.</p> <p>Identify the suitable drive system for this application. [3 marks]</p> <p>Also illustrate the choice and specifications of the intricate components of such a system, the reason for the choice of these intricate components in this drive system. [7 marks]</p>	10
5.	<p>A parking sensor is an essential tool for drivers due to its exceptional convenience, efficiency, and safety features. It has become an indispensable technology for those seeking to enhance their parking experience.</p> <p>Identify a suitable sensor for this application. [3 marks]</p> <p>Elucidate its functionality and merits of sensor selected for the above scenario. [7 marks]</p>	10
6.	<p>Examine digital images and their representations. [2 marks]</p> <p>Justify image quality with a focus on image resolution with suitable example. [3 marks]</p> <p>Additionally, explore the steps integral to image processing tasks.</p> <p>[5 marks]</p>	10

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