![Galgotias University logo]

School of Computing Science and Engineering

Bachelor of Technology in Computer Science and Engineering
Semester End Examination - Jul 2024

Duration : 180 Minutes
Max Marks : 100

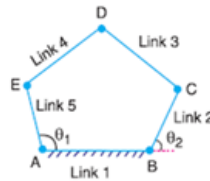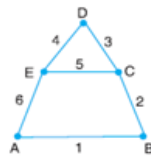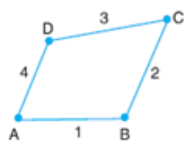**Sem VI - E2UC510T - Mechanisms Machines and Automation**

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1)	A differential gear in automobilies is used to	K1(2)
2)	Can you give examples of real-world applications where integration with control systems has significantly improved productivity?	K2(4)
3)	Determine the mobility (degrees of freedom) of the mechanism shown below using Kutzbach mobility criterion and classify them.	K2(6)

4)	Illustrate briefly about the factors for the amount of Power transmission in automobile.	K3(9)
5)	Briefly describe what a Flexible Manufacturing System (FMS) is and provide an example of its application.	K3(9)
6)	Design an automated system for a manufacturing process that involves multiple intricate steps and requires real-time adjustments. Explain the components and control mechanisms you would use.	K5(10)
7)	Describe a situation where a combination of electric and hydraulic actuators is used in an automated system and justify this choice.	K4(12)
8)	The mass of flywheel of an engine is 6.5 tonnes and the radius of gyration is 1.8 metres. It is found from the turning moment diagram that the fluctuation of energy is 56 kN-m. If the mean speed of the engine is 120 r.p.m., find the maximum and minimum speeds.	K5(15)
9)	Develop a predictive maintenance plan for an automated system, considering factors like critical component identification, monitoring techniques, and maintenance schedules.	K5(15)
10)	The driving crank AB of the quick-return mechanism, revolves at a uniform speed of 200 r.p.m. Find the velocity and acceleration of the tool-box R, in the position shown, when the crank makes an angle of 60° with the vertical line of centres PA. What is the acceleration of sliding of the block at B along the slotted lever PQ ?	K6(18)