Name: **Enrolment No:**	

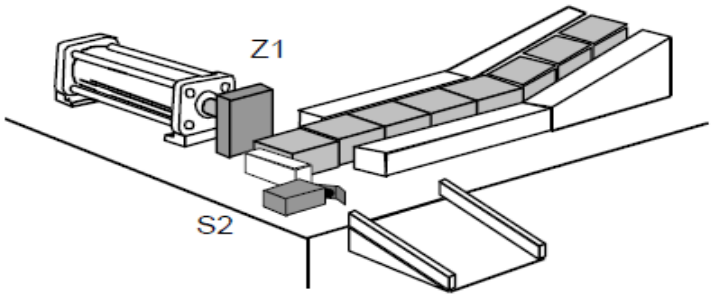
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2023

Course: Introduction to Mechatronics — **Semester: II**
Program: B. Tech (Mechatronics Engineering) — **Time: 03 hrs.**
Course Code: MECH 1010 — **Max. Marks: 100**

Instructions: This question paper has three sections, Section A, Section B, and Section C.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	What are sensors and actuators? List out different sensors and actuators widely used for system development.	**4**	**CO1**
Q 2	Define the mechatronics system with a neat sketch.	**4**	**CO2**
Q 3	Explain the automation pyramid.	**4**	**CO3**
Q 4	What are the different types of electrical transducers?	**4**	**CO3**
Q 5	Define Modular Production Systems used in the automation industry.	**4**	**CO1**
SECTION B **(4Qx10M= 40 Marks) (Answer any four questions)**			
Q 6	List out different domains and their application to mechatronics engineering.	**10**	**CO3**
Q 7	Elucidate different factors influencing the selection process for the choice of the transducer.	**10**	**CO4**
Q 8	Explain different reasons for making the system automated.	**10**	**CO4**
Q 9	Describe a relay circuit to control any pneumatics and electro-pneumatics system.	**10**	**CO4**
Q 10	Design a circuit for implementation on PCB for power supply and LED lamp.	**10**	**CO3**
SECTION-C **(2Qx20M=40 Marks)**			
Q 11	Explain the control system with all attributes and list out one example each with a neat diagram of the following: 1. Open-Loop Control Systems 2. Closed-Loop Control Systems 3. Multivariable Control System	**20**	**CO5**

	OR Wok pieces coming from a transfer system are to be separated as shown below figure. Design pneumatic circuit, relay logic control circuit to control as: 1. Manual operation 2. Automatic operation  		
Q 12	Design a system using a microprocessor-based control system to do the following task and write code, flowchart, and block diagram to justify your answer.  • Read the temperature in a room. • Display the temperature on the LCD panel. • Turn on a fan if the temperature is above 25^0C. • Turn on a heater if the temperature is below 20^0C.	**20**	**CO5**