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**Presidency University**

**Bengaluru**

 **SCHOOL OF ENGINEERING**

**MAKE-UP EXAMINATION – SEP 2023**

**Course Code**: MEC 218

**Course Name**: Mechatronics

**Program & Sem**: B. Tech

**Date**: 03.10.2023

**Time**: 9.30 AM TO 12.30 PM

**Max Marks**: 100

**Weightage**: 50%

 **Instructions:**

1. *Read the all questions carefully and answer accordingly.*

**Part A [Memory Recall Questions]**

**Answer all the Questions. Each question carries 6 marks. (5Qx6M = 30M**)

Q.NO.1. What is mechatronics. With the suitable diagram explain mechatronics system.

 (C.O.No.1) [Knowledge]

Q.NO.2 What are Directional Control Valves?

 (C.O.No.2) [Knowledge]

Q.NO.3. What are actuators. With suitable example explain different types of actuators.

 (C.O.No.3) [Knowledge]

Q.NO.4. What are the difference between closed loop and open loop system?

 (C.O.No.4) [Knowledge]

Q.NO.5. What are logic gates explain with suitable diagram? (C.O.No.4) [Knowledge]

**Part B [Thought Provoking Questions]**

**Answer all the Questions. Each question carries 10 marks. (4Qx10M=40M)**

Q.NO.6. In a remote village somewhere in Bihar, a man is pulling a bucket of water from a well. Can we consider the man, rope and bucket of water as system? If yes, what is the system this belongs and why. If No, why. (C.O.No.3) [Application]

Q.NO.7. Consider 2 actuation systems, Type A and Type B. Type A requires to deliver high torque with low velocity of operation, while the Type B must deliver high velocity of operation with low torque. Among the 2 types, w023hich one is more suitable with a hydraulic actuation system? Can a pneumatic actuation system be used instead? Elaborate your opinion. (C.O.No.3) [Application]

Q.NO.8. Technology where a fluid is used to move the energy from, for example an electric motor to an actuator. Identify the system and explain the working with suitable diagram.

 (C.O.No.2) [Comprehension]

Q.NO.9. Consider the installation of an automatic door at a retail outlet. The door should be designed to sense the presence or arrival of customers in the door vicinity, and actuate a mechanism to open the door automatically. Suggest few sensors which can be used to detect the presence of customers. Describe the working of such sensors in brief. (C.O.NO.2) [Application ]

**Part C [Problem Solving Questions]**

**Answer all the Questions. Each question carries 15 marks. (2Qx15M=30M)**

Q.NO.10. Describe the set up for a cylinder sequencing of A+B+A-B- with suitable figure. Also explain the components involved in detail. (C.O.No.3) [Comprehension]

Q.NO.11. What are the various techniques adopted for signal conditioning? Describe them in detail along with suitable figures, charts or plots. (C.O.No.2) [Comprehension]