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**PRESIDENCY UNIVERSITY BENGALURU**

**SCHOOL OF ENGINEERING SET-A**

**END TERM EXAMINATION – MAY/JUNE 2024**

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| **Semester :** Semester IV - 2022  **Course Code :** MEC3006  **Course Name :** - Mechatronics  **Program :** B. Tech. | **Date :** June 20, 2024  **Time :** 9:30 AM - 12:30 PM  **Max Marks :** 100  **Weightage :** 50% |
| **Instructions:**   1. *Read all questions carefully and answer accordingly.* 2. *Question paper consists of 3 parts.* 3. *Scientific and non-programmable calculator are permitted.* 4. *Do not write any information on the question paper other than Roll Number.* |  |

# PART A

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|  | **ANSWER ANY FIVE QUESTIONS**  **1.** What is Mechatronics? Explain with suitable example.  **2.** What is control system and what are the classification of control system.  **3**. What are differences between single acting and double acting cylinder?  **4**. What are gear pumps?    **5**. What is system?  **6**. What are sensors? What are the functions of sensors?  **7**. What are the different functions of signal conditioner?  **PART B** | **5QX2M=10 MARKS**    (CO1) [Knowledge]    (CO2) [Knowledge]    (CO3) [Knowledge]    (CO4) [Knowledge]    (CO1) [Knowledge]    (CO2) [Knowledge]    (CO3) [Knowledge] |
|  | **ANSWER ANY FIVE QUESTIONS** | **5QX10M=50 MARKS** |

1. An inductive proximity sensor can only detect metal targets. This is because the sensor utilizes anelectromagnetic field. When a metal target enters the electromagnetic field, the inductive characteristics of the metal change the field’s properties, thereby alerting the proximity sensor of the presence of a metallic target. Identify the type of sensors and explain with suitable diagram.

(CO1) [Comprehension]

1. With suitable diagram explain the differences between single acting cylinder and double acting cylinder.

(CO2) [Comprehension]

1. What is photo emission effect? Explain.

(CO3) [Comprehension]

1. Define measurement system? With suitable block diagram explain the elements of measurementsystem.

(CO1) [Comprehension]

1. A mechatronics system is, indeed, composed of mechanical parts, electric devices, electronicscomponents, sensors, hardware and it is operated and controlled under the supervisions and commands that are programmed through suitable software. With suitable diagram explain the working of automatic camera.

(CO2) [Comprehension]

1. Parking sensors in a car are used to measure the distance of the car from an object. Name any twotypes of sensors which can be used for this purpose and explain the working.

(CO3) [Comprehension]

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| **14.** | List and explain different types of Directional control valves.  **PART C** | (CO3) [Comprehension] |
|  | **ANSWER ANY TWO QUESTIONS** | **2QX20M=40 MARKS** |

1. Many control systems employ pneumatic or hydraulic cylinders as the actuating elements and requirea sequence of extensions and retractions of the cylinders to occur. With suitable circuit diagram explain the sequence of A+B+B-A- .

(CO1) [Application]

1. A pump is a type of positive displacement (PD) pump. It moves a fluid by repeatedly enclosing afixed volume using interlocking cogs or gears, transferring it mechanically using a cyclic pumping action. With suitable diagram explain the working of gear pump and vane pump.

(CO2) [Application]

1. Many control systems employ pneumatic or hydraulic cylinders as the actuating elements and requirea sequence of extensions and retractions of the cylinders to occur. With suitable circuit diagram explain the sequence of A+B+A-B- .

(CO3) [Application]