Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
END TERM EXAMINATION - JUN 2023

Semester : Semester IV - 2021
Course Code : MEC3006
Course Name : Sem IV - MEC3006 - Mechatronics
Program : MEC

Date : 9-JUN-2023
Time : 9.30AM - 12.30PM
Max Marks : 100
Weightage : 50%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **(5 X 2 = 10M)**

1. Write a short note an ampification process.

(CO2) [Knowledge]

2. Explain Rack and Pinion system.

(CO1) [Knowledge]

3. What are Pneumatic systems.

(CO3) [Knowledge]

4. What are Vane pumps?

(CO4) [Knowledge]

5. Define mechatronics.

(CO3) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **(6 X 10 = 60M)**

6. A hydraulic pump is a mechanical source of power that converts mechanical power into hydraulic energy. With suitable diagram explain any one type of hydraulic pump.

(CO3) [Comprehension]

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

(CO3) [Comprehension]

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

(CO3) [Comprehension]

9. Both a sensor and a transducer are used to sense a change within the environment. In what way both are different in terms of application.

(CO4) [Comprehension]

10. Microprocessor and Microcontroller based control systems have become increasingly popular not only in mechatronics systems but in many industrial applications because of their versatility, functionality and high integration level. With suitable block diagram explain the working of automatic washing machine system.

(CO3) [Comprehension]

11. A control system is a mechanical or electronic device that automatically regulates a system to maintain a desired state or set point without human interaction. with suitable block diagram explain closed loop control system.

(CO3) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS **(2 X 15 = 30M)**

12. In a hydraulic system, pressurized oil is provided by a pump driven by an electric motor.The pump supplies oil from a sump through a non-return valve and an accumulator to the system, from which it returns to the sump. With suitable diagram explain the working of Hydraulic system.

(CO2) [Application]

13. Sensor utilizes an electromagnetic 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.

(CO3) [Application]