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**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
MID TERM EXAMINATION - APR 2023**

Semester : Semester IV - 2021

Date : 13-APR-2023

Course Code : PET2005

Time : 09:30AM -11:00AM

Course Name : Sem IV - PET2005 - Fundamentals of Instrumentation and Control Engineering

Max Marks : 50

Program : PET

Weightage : 25%

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.*
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PART A

ANSWER ALL THE QUESTIONS

(5 X 2 = 10M)

1. With a suitable example describe open-loop system
(CO1) [Knowledge]
2. State the fundamental elements of a block diagram.
(CO1) [Knowledge]
3. State the disadvantages of the feedback system.
(CO1) [Knowledge]
4. Define transient time response.
(CO2) [Knowledge]
5. Define closed loop system with a suitable example,
(CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

(2 X 10 = 20M)

6. "The processing part of a feedback system may be electrical or electronic, ranging from a very simple to a highly complex circuits." Based on the above statement, explain the implementation of a typical feedback control system, reviewing the negative and positive feedback.

(CO1) [Comprehension]

7. Process control are methods used to monitor and regulate the industrial process. Based on the given statement, state the objectives of the given process. Being a process control engineer, state the methods to achieve these objectives.

(CO2) [Comprehension]

PART C

ANSWER THE FOLLOWING QUESTION

(1 X 20 = 20M)

8. "The basic control algorithm for a single tank system is a feedback loop that adjusts the pump speed based on the difference between the measured level and the setpoint. The controller calculates an error signal by subtracting the measured level from the setpoint, and then uses this error signal to adjust the pump speed."

- a. Apply the required mass balance equation to establish the model equations for the above-mentioned system.
- b. Illustrate the system as mentioned above through a diagram.
- c. Demonstrate the application of the above mentioned system.

(CO2) [Application]