

Roll No



**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
END TERM EXAMINATION - JUN 2023**

Semester : Semester IV - 2021

Course Code : PET2005

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

Program : PET

Date : 12-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

(10 X 3 = 30M)

1. Write minimum four requirements of the process. (CO2) [Knowledge]
2. Define set point and controlled variable. (CO2) [Knowledge]
3. Define the cause of control system deviation. (CO2) [Knowledge]
4. Justify with proper explanation thermostat is open loop system or closed loop system. (CO1) [Knowledge]
5. Define load variable with proper example. (CO3) [Knowledge]
6. Define ideal control action. (CO3) [Knowledge]
7. Define the different name of feed-back system. (CO3) [Knowledge]
8. Define system in terms of Process Control. (CO1) [Knowledge]
9. "Closed-loop system" is an important in petroleum industry justify this point. (CO3) [Knowledge]
10. What is time constant justify with a proper diagram. (CO3) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

(2 X 15 = 30M)

11. Consider the working of an air conditioner. An operator was trying to maintain a room temperature between 18°C temperature. It was observed that the ambient temperature was 26°C. As a control engineer
- (a) Which type of loop system do you suggest as if room temperature can reach 18°C temperature.
 - (b) Why you are suggesting that a particular loop system justify your answer with proper definition properties and diagram.

(CO2) [Comprehension]

12. An electric oven with a coil started for preparing food. It is observed while the switch is on, instantly it can't use to prepare food or boiling water. Why it is happening justify in terms of time response.

(CO3) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS

(2 X 20 = 40M)

13. Sun petrochemical installed a separator for separate natural gas and water mixture. During the time of installation, they forgot to mention residence time in log book. During the time of operation operator observed gas and water are coming out as heterogeneous mixture. As a process control engineer you determine the general residence time to separate gas and water mixture from separator.

(CO3) [Application]

14. A mixture of crude gas and water extracted and collected in a closed loop batch separator. The purpose of batch separator to collect crude from the mixture. If the inlet concentration of the mixture is CA_i mol/L and outlet concentration of crude is CA_0 mol/L then determine the time response (t) -
- (a) If there is no extra crude separator
 - (b) An unit crude separator attached
 - (c) "n" no of crude separator attached

(CO3) [Application]