ROLL NO.	

PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 40 | Max Time: 120 Mins | Weightage: 40 %

ENDTERM FINAL EXAMINATION

I Semester AY 2017-18 | Course: **PET 311 PROCESS DYNAMIC CONTROL & INSTRUMENTATION** | 22 DECEM 2017

Instructions:

i. Write legibly

ii. Scientific and non-programmable calculators are permitted

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Part A

[3 Q x 4 M= 12 Marks]

Answer any ***three*** from the following:

1. Define any the following:

(a) Stability (b) Bode diagram (c) Crossover frequency (d) Valve positioner

2. Differentiate between Air-to-Close and Air-to-Open valves with proper figure and notations.

3. Determine the Routh criterion for the following characteristic equation $s^3+7s^2+3s+5=0$, and determine whether the system is stable.

4. Explain in brief with proper figure about the load response of a typical control system using various modes of control.

Part B

[3 Q x 5 M= 15 Marks]

5. Find the amplitude ratio and phase angle of second order function and determine the form of response after the steady state oscillations are established with $\tau = 2$ and $\square = 0.8$, being disturbed with a sine wave input of 5 sin (t).

6. Explain briefly about Ratio control with a control diagram & block diagram of a particular system.

(OR)

Explain briefly about Feed forward control with a control diagram & block diagram of a particular system.

7. Explain different Inherent valve characteristics with proper figure, sensitivity and relationship.

Part C

[1 Q x 13 M= 13 Marks]

8. Draw the root locus diagram for the open loop transfer function is

$$G(s) = \frac{K}{(s+1)(2s+1)}$$

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Max Marks: 20 | Max Time: 60 Mins | Weightage: 20 %

TEST 2

I Semester AY 2017-2018 | Course: **PET 311 PROCESS DYNAMIC CONTROL & INSTRUMENTATION** | 28 OCT 2017

Instructions:

i. Write legibly
ii. Draw diagrams with pencil only

Part A

(1Q x 4M= 04 Marks)

1. Define any ***four*** from the following:

(a) Measurement Lag (b) Feedback path (c) Load (d) Closed loop (e) Servo problem

Part B

(1Q x 6M= 06 Marks)

2. Draw neat block diagram and write proper notations for any ***two*** of the following:

i. Measurement lag
ii. Overall transfer function for change in load
iii. Proportional controller

Part C

(1Q x 10M= 10 Marks)

3. Define controller. Explain different types of controller with proper transfer functions and notations.

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Max Marks: 20 | Max Time: 60 Mins | Weightage: 20 %

TEST 1

I Semester 2017-2018 | Course: **PET 311 PROCESS DYNAMIC CONTROL & INSTRUMENTATION** | 22 SEPT 2017

Instructions:

i. Write legibly
ii. Scientific and non programmable calculators are permitted

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Part A

(1Q x 4M= 04 Marks)

1. Define the following:
(a) Error (b) Transfer function (c) Overshoot (d) Response time

Part B

(2Q x 3M= 06 Marks)

2. A thermometer having a time constant of 0.2 min is at a steady state temperature of 90°F. At time t=0, the thermometer is placed in a temperature bath maintained at 100°F. Determine the time needed for the thermometer to read 95°F.

3. Draw any three forcing functions graphically and label it properly.

Part C

(1Q x 10M= 10 Marks)

4. Derive a transfer function of Liquid level process (Continues) with the help of neat diagram.