Control Engineering and Automation VTU CBCS Question Paper Set 2018

10MR82

USN

Eighth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Control Engineering and Automation

Time: 3 hrs. Max. Marks:100

Note: *Answer FIVE full questions, selecting at least TWO questions from each part.*

PART – A

1 a. Drive the Derivation of transfer function of first order Liguid system. **(10 Marks)**

b. Reduce the block diagram shown in Fig. Q1(b) to canonical form and determine transfer function $\frac{C(s)}{R(s)}$. If $G_1 = H_1 = 1$, $G_2 = H_2 = 2$, $G_3 = H_3 = 3$. **(10 Marks)**

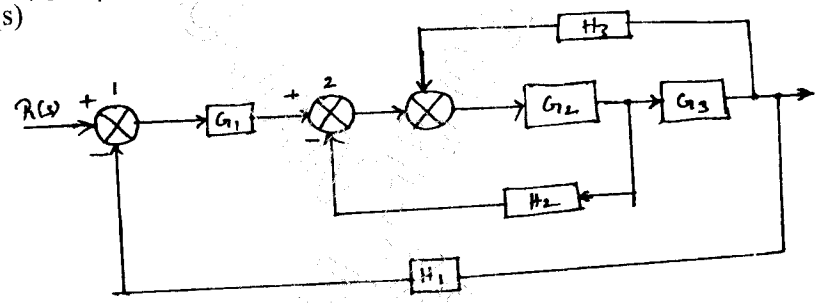

Fig Q1(b)

2 a. State and Explain steady state errors of Type – I unit feedback system. **(10 Marks)**

b. A unity feedback system is characterized by an open loop transfer function $G(s) = \frac{10}{S^2 + 2s + 6}$. Determine the following, when the system is subjected to unit step input i) Undamped natural frequency ii) Damping ratio iii) Peak over shoot iv) Peak time and v) Settling time. **(10 Marks)**

3 a. Write a note on stack Type controller. **(10 Marks)**

b. With a neat sketch explain pneumatic amplificator [Relay] system. **(10 Marks)**

4 a. With a neat sketch explain working of piston actuators. **(10 Marks)**

b. With a neat sketch explain working of valve positioners. **(10 Marks)**

PART – B

5 a. With a neat sketch explain variable inductance transducer. **(10 Marks)**

b. Illustrate with neat diagram and explain Flapper Nozzle. **(10 Marks)**

6 a. With a neat sketch explain marine Boiler combustion control system. **(10 Marks)**

b. Explain working of two-element water level control system with diagram. **(10 Marks)**

7 a. With the help of neat diagram explain working of piston cooling water system. **(10 Marks)**

b. With a neat sketch explain working of fuel oil system. **(10 Marks)**

8 a. How does the micro controller operates? Explain. **(10 Marks)**

b. Explain integrated automation control and monitoring (IC and MS). **(10 Marks)**

* * * * *

USN | | | | | | | | | | |

10MR82

Eighth Semester B.E. Degree Examination, June/July 2016
Control Engineering and Automation

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. Derive the transfer function of field – controlled DC motor. **(10 Marks)**

b. Reduce the block diagram as show in Fig. Q1(b) to the simplest possible form of find its

c. closed loop transfer function. **(10 Marks)**

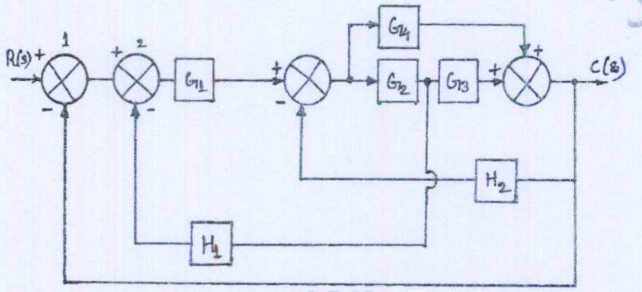

Fig. Q1(b)

2 a. Explain Nyquist stability criterion. **(10 Marks)**

b. By applying Routh criterion, discuss the stability of the closed loop system as a function of K for the following open loop transfer function :

$$G(s)H(s) = \frac{K(s+1)}{s(s-1)(s^2+4s+16)}.$$ **(10 Marks)**

3 a. Write brief about proportional integrate derivative controller. **(10 Marks)**

b. State of explain stack type controller principle. **(10 Marks)**

4 a. Sketch and describe the functioning of a diaphragm actuator. **(10 Marks)**

b. Sketch and describe the functioning of a valve positioner. What are the advantages of using of a valve positioner? **(10 Marks)**

PART – B

5 a. With a neat sketch explain variable inductance transducer and capacitance transducer. **(10 Marks)**

b. Write about the force–balance transducer. **(10 Marks)**

6 a. Write neat sketch explain. Marine boiler combustion control system. **(10 Marks)**

b. Explain steam pressure control and fuel oil temperature control system with neat sketch. **(10 Marks)**

7 a. With a neat sketch, explain direct reversing diesel engine by bridge control method. **(10 Marks)**

b. With a neat sketch, explain working of jacket cooling water. **(10 Marks)**

8 a. What is PLC? Explain basic components of the PLC. **(06 Marks)**

b. Explain integrated automation control and monitoring [ICAMS] system. **(06 Marks)**

c. How does the micro controller operates? **(08 Marks)**

* * * * *

USN | | | | | | | | | | |

10MR82

Eighth Semester B.E. Degree Examination, June/July 2017
Control Engineering and Automation

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Reduce the block diagram as shown in Fig.Q1(a) to its simplest possible form and find its closed loop transfer function.

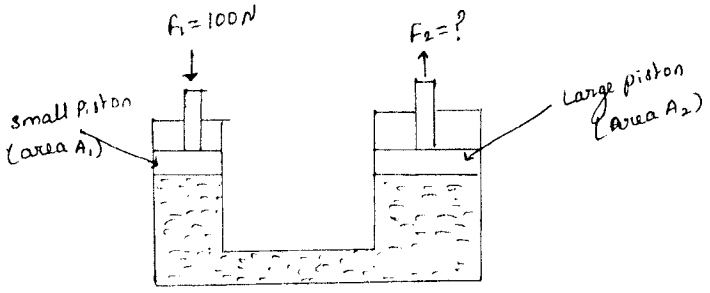

Fig.Q1(a) **(14 Marks)**

b. Write real time application of temperature control system. **(06 Marks)**

2 a. By applying Routh criterion, discuss the stability of the closed loop system as a function of K for the following loop transfer function

$$G(s)H(s) = \frac{K(s+1)}{s(s-1)(s^2+4s+16)}$$ **(12 Marks)**

b. Write feedback characteristics of control system. **(08 Marks)**

3 a. With a neat sketch, explain stack type controlled principle. **(12 Marks)**

b. Write short notes on pneumatic amplifier or relay and with a neat sketch, explain non-bleed type of relay. **(08 Marks)**

4 a. Describe with sketch the functioning of a valve positioned. What are advantages of using of a valve positioner? **(12 Marks)**

b. Write the arrangement of nozzle flapper with the help of neat sketch. **(08 Marks)**

PART – B

5 a. Write the brief note about force balance transducer. **(12 Marks)**

b. With a neat sketch, explain electronic force balance transducer. **(08 Marks)**

6 a. Explain steam pressure controller with neat sketch. **(07 Marks)**

b. With a neat sketch, explain working of fuel oil temperature control system. **(07 Marks)**

c. Explain working of two element type water control with sketch. **(06 Marks)**

7 a. With a neat sketch, explain working of Jacket water cooling system. **(10 Marks)**

b. With a neat sketch, explain working of fuel vatic cooling water control. **(10 Marks)**

8 a. What is PLC? Explain basic components of the PLC with advantages. **(08 Marks)**

b. Write the comparison between traditional control and PLC. **(06 Marks)**

c. How does microcontroller works? **(06 Marks)**

* * * * *