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10MR82

Eighth Semester B.E. Degree Examination, June/July 2018
Control Engineering & Automation

Time: 3 hrs. Max. Marks:100

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

PART – A

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

b. Reduce the block diagram as shown in Fig. Q1 (b) to its simplest possible form and find the closed loop transfer functions. **(10 Marks)**

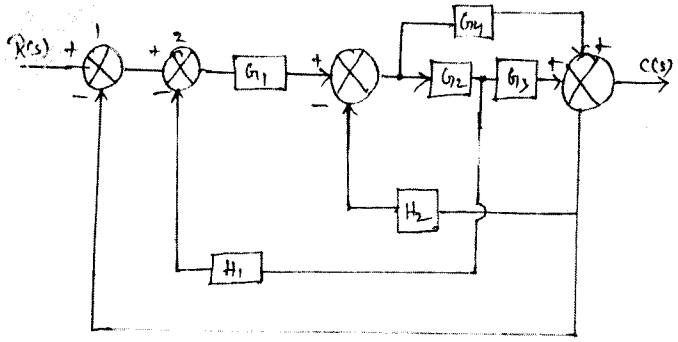

Fig. Q1 (b)

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 in brief about proportional integral derivative controller. **(10 Marks)**

b. State and 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. With a 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 Jocket cooling water. **(10 Marks)**

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

b. Explain Integrated Automation Control and Monitoring [IACMS] System. **(06 Marks)**

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

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