

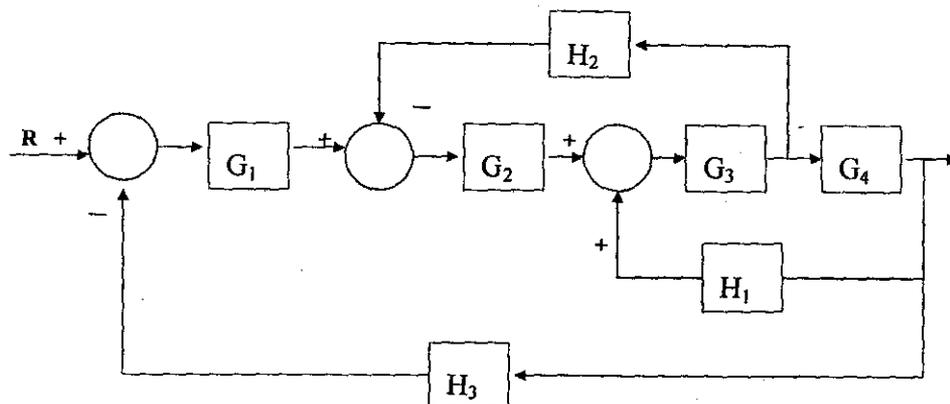
**B. Tech Degree VIII Semester Examination in
Marine Engineering, January 2010**

MRE 804 MARINE CONTROL ENGINEERING AND AUTOMATION

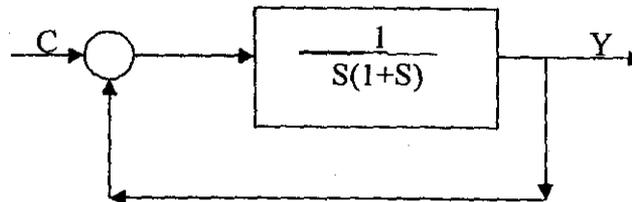
Time: 3 Hours

Maximum Marks: 100

- I. (a) Describe with the aid of suitable diagrams of level measuring devices. (12)
 (b) Write a short note on tachometer. (8)
- OR**
- II. (a) Sketch and describe how a flapper-nozzle device controls the pneumatic pressure in an air line. (12)
 (b) Discuss the importance of oil mist detector. (8)
- III. Explain any four of the following terms with the help of suitable diagrams.
 (i) Feedback loop (ii) Closed loop
 (iii) ON-OFF system (iv) Set value
 (v) Cascade control system (vi) Proportional control system (4x5= 20)
- OR**
- IV. Explain the functioning of proportional controller? What is the effect of adding Integral and Derivative function to it? (20)
- V. (a) Sketch and describe the functioning of a valve positioner. What are the advantages of using of a valve positioner? (10)
 (b) Write a short note on automatic controller PLC. (10)
- OR**
- VI. (a) Sketch and describe the functioning of a Diaphragm Actuator. (7)
 (b) Find the transfer function of the given system shown below. (13)



- VII. (a) Draw the Nyquist diagram for the control system with the block diagram given below. (13)

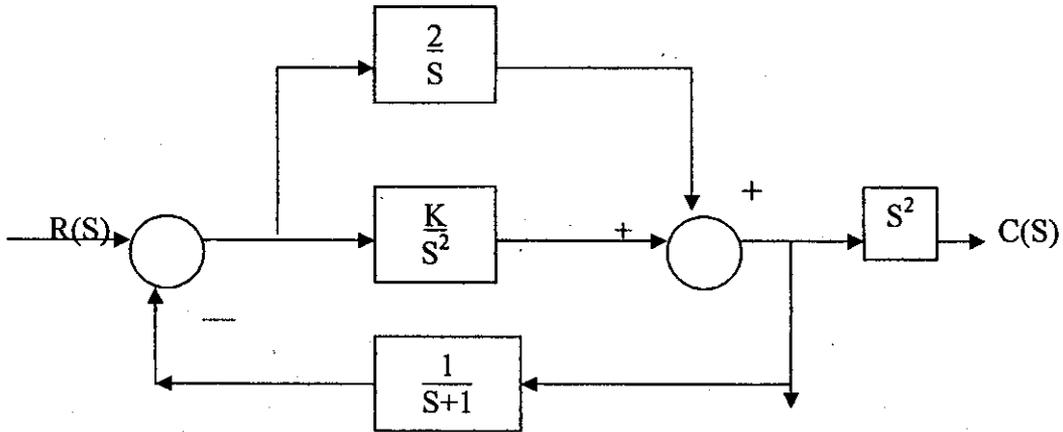


(Turn Over)

- (b) Derive the transient response of a first order system for unit step input. (7)

OR

- VIII. (a) Explain the Nyquist stability criteria. (7)
 (b) Find the range of K for the given stable system shown below by using Rouths Hurwitz Criteria. (13)



- IX. (a) With the help of a block diagram explain the process of starting of a direct reversing Diesel Engine with Bridge Control. What are the starting interlocks usually provided? (10)
 (b) What should be the 'Fail Safe' arrangement for the above system? Discuss if the control valve can be 'NO' or 'NC' Type. (10)

OR

- X. (a) Sketch and describe a system used for cooling water temperature control of a main machinery unit. (10)
 (b) Discuss the instrumentation requirements for a UMS class vessel. (10)
