BT–MRE – VIII – 07.16 –0844 Reg. No. | | | | | | | | |

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B.Tech. Degree VIII Semester Examination in Marine Engineering July 2016

MRE 805 (E) FLUID CIRCUITS AND CONTROL

Time : 3 Hours Maximum Marks : 100

(5 × 20 = 100)

I. (a) Explain different types of pressure control valves with diagram, symbol and working for each. (15)

(b) Explain sealing and packing. (5)

OR

II. (a) Explain how an orifice is used as a flow measuring device with neat diagram and equations. (6)

(b) Explain the working of shuttle valve with diagram. (6)

(c) Explain the following.

(i) Relay. (4)

(ii) Pressure switch. (4)

III. (a) Compare hydraulic and pneumatic system. (6)

(b) Derive the transfer function for hydraulic and pneumatic system. (14)

OR

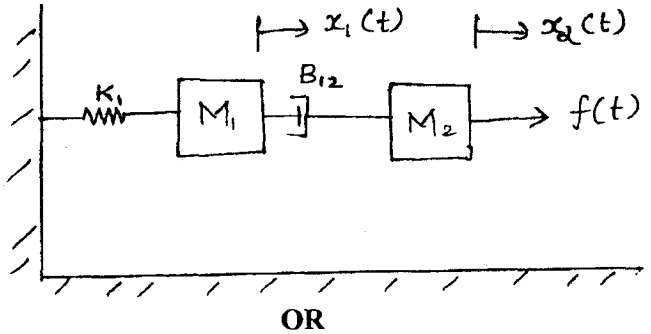
IV. (a) Explain the properties of air for pneumatic control (8)

(b) What is fluid power? Discuss its advantages and disadvantages. (6)

(c) Explain two applications of fluid power. (6)

V. (a) What is a compressor? Explain different types of compressors with diagrams. (10)

(b) Find the electrical analogous circuit for the mechanical system and find the transfer function. Draw the circuit using voltage source and show the F-V relations. (10)



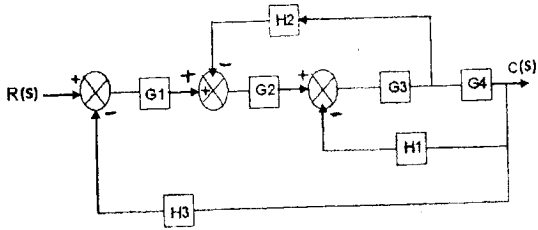
OR

VI. (a) Explain different types of accumulators with diagrams. (12)

(b) Draw and explain one application of accumulator with neat circuit. (8)

(P.T.O.)

VII. (a) Reduce the block diagram. (8)



(b) Using Routh Hurwitz criteria find the stability of a unity system having characteristic equation as (12)

$$s^7 + 5s^6 + 9s^5 + 9s^4 + 4s^3 + 20s^2 + 36s + 36 = 0$$

OR

VIII. Explain the following. (20)

(i) Fluid coupling.
(ii) Hydraulic riverter.
(iii) Hydraulic lift.
(iv) Fluid torque converter.

IX. (a) What is root locus? Explain its significance for finding the stability of a system. (5)

(b) Sketch the root locus for the system with open loop transfer function (15)

$$\frac{K}{s\left(s^2 + 4s + 13\right)}$$

Find the maximum value of k for which the system is stable.

OR

X. (a) Find the response of a system whose transfer function is given by $\frac{5}{s^2 + 5s + 6}$ (12)

(b) Derive the transfer function for a thermal system. (8)

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