B. Tech Degree VIII Semester Examination in Marine Engineering December 2010

MRE 805   FLUID CIRCUITS AND CONTROL

Time : 3 Hours

Maximum Marks : 100

I. Explain *any five* of the following terms with the help of suitable diagrams :

(a)	Actuators	(b)	Compressor
(c)	Packing	(d)	Thermostat
(e)	Pipe coupling	(f)	Float switch

(5 x 5 = 25)

OR

II. Explain the different types of valves. Describe with the aid of suitable diagrams.   (25)

III. (a) Differentiate between pneumatic system and hydraulic system.   (10)

(b) Explain pneumatic actuators with the help of suitable diagrams and derive its transfer function.   (15)
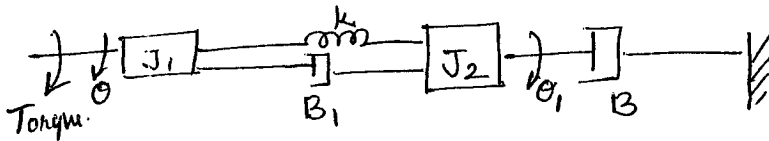
OR

IV. (a) Write the fluid properties of a pneumatic system.   (8)

(b) Derive an expression for the transfer function of a Hydraulic system.   (17)

V. (a) Find the transfer function of the given systems.   (2 x 9 = 18)

(i)
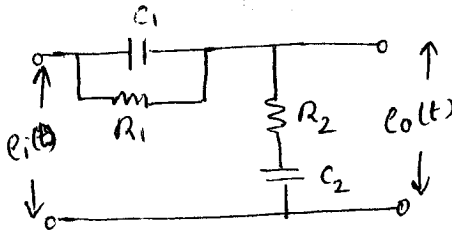
(ii)

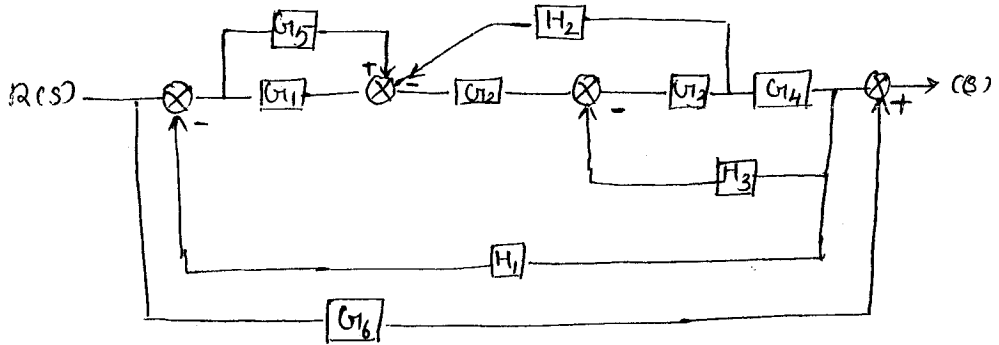(b) Compare between open loop and closed loop systems.   (7)

OR

VI. (a) Write a description about positive displacement pumps.   (10)

(P.T.O.)

(b) Reduce the block diagram given below : (15)

VII. (a) The open loop transfer function of a unity feedback system is given by
$G(s) = \dfrac{K(1+s)}{s^3 + a s^2 + 2s + 1}$. Determine the value of K and a, so that the

system oscillates at a frequency of 2 rad/sec. (10)

(b) Sketch root locus for unity feed back system, whose open loop transfer function is

$\dfrac{K}{s(s+1)(s+2)}$. Find the range of K. (15)

OR

VIII. Write a short note on :
            (i)   Hydraulic press
            (ii)   Hydraulic crane
            (iii)   Hydraulic lift
            (iv)   Stability
            (v)   Routh Hurwitz Criteria   (5 x 5 = 25)

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