# B.Tech Degree VIII Semester Examination in Marine Engineering June 2011

MRE 805 FLUID CIRCUITS AND CONTROL

Time: 3 Hours

Maximum Marks: 100

I.   (a)   Explain **any three** of the following terms with the help of suitable diagrams.
   (i)   Thermostat
   (ii)   Pressure Switch
   (iii)   Pipe coupling
   (iv)   Piping and fitting   (3 x 5 = 15)

   (b)   Explain the importance of symbols alongwith various hydraulic terms.   (10)

OR

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

III.   Explain the role of transfer function in hydraulic system with an example. Explain the properties of the system.   (25)

OR

IV.   Explain the role of transfer function in pneumatic system with an example. Explain the properties of the system.   (25)

V.   (a)   Briefly explain positive displacement pump.   (10)

   (b)   Find the transfer function of the given electrical system shown below.   (15)
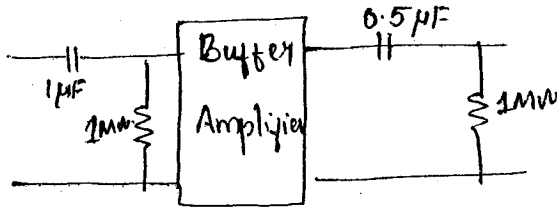
OR

VI.   (a)   Reduce the block diagram shown below.   (13)

(P.T.O.)
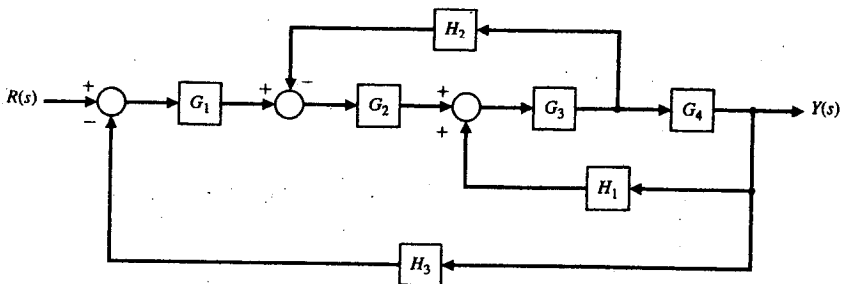
(b) The suspension system for one wheel of an old fashioned pick up truck shown in figure. The mass of the vehicle is **m1** and the mass of the wheel is **m2**. The suspension spring has a spring constant **k1** and the tire has a spring constant **k2**. The damping constant of the shock absorber is **b**. Find the vehicle response to bumps in the road. (12)
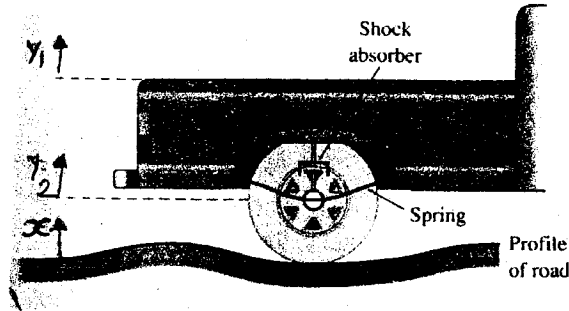
VII. (a) A unity feed back system has an open loop transfer function of

$G(S) = \dfrac{ke^{-s}}{s(s^2 + 5s + 9)}$. Determine the maximum value of 'k' for stability

of a closed loop system. (10)

(b) Write short notes on:
    (i) Fluid couplings
    (ii) Hydraulic crane. (8 + 7 = 15)

OR

VIII. (a) Write short notes on:
    (i) Hydraulic press
    (ii) Hydraulic lift

(b) Sketch the root locus of the given open loop transfer function is

$G(S) = \dfrac{k}{s(s^2 + 4s + 13)}$

(25)

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