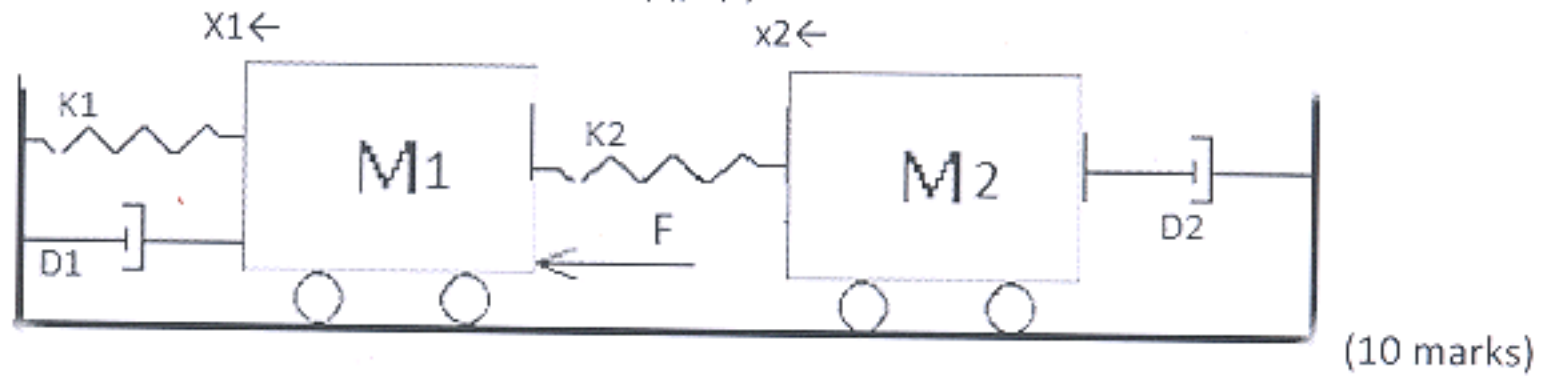


PART-B

Answer *one question* from each module

MODULE I

11. a) Write the differential equation governing the behaviour of the mechanical system shown below. Obtain the transfer function $X_2(s)/F(s)$.

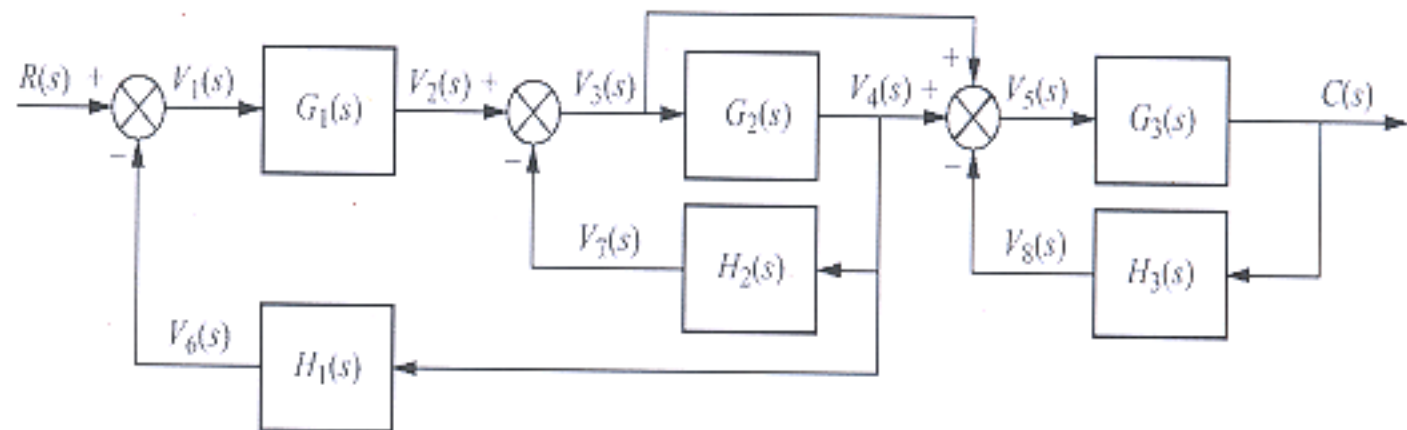


- b) A unity feedback control system has the following open loop transfer function $G(s) = \frac{4s+1}{4s^2}$. Find expressions for its time response when it is subjected to

- i) unit impulse response
- ii) Unit step response

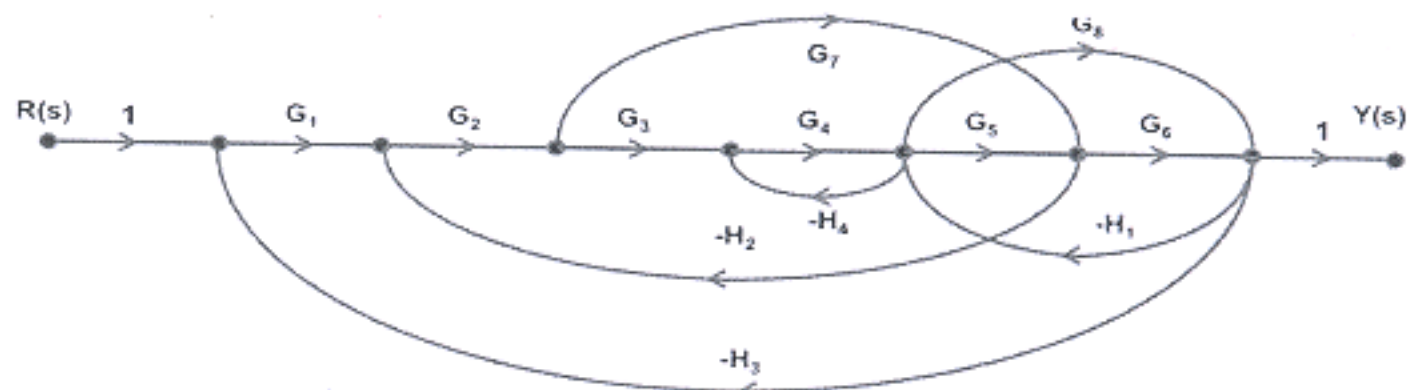
(10 marks)

12. a) Obtain the transfer function using block diagram reduction techniques.



(10 marks)

- b) Obtain the transfer function using Mason's gain formula



(10 marks)

MODULE II

13. a) Sketch the Bode plot for the system having its open loop transfer function as $G(s)H(s) = \frac{20}{s(s+1)(s+4)}$. Find the phase margin and gain margin and comment on stability.

(10 marks)