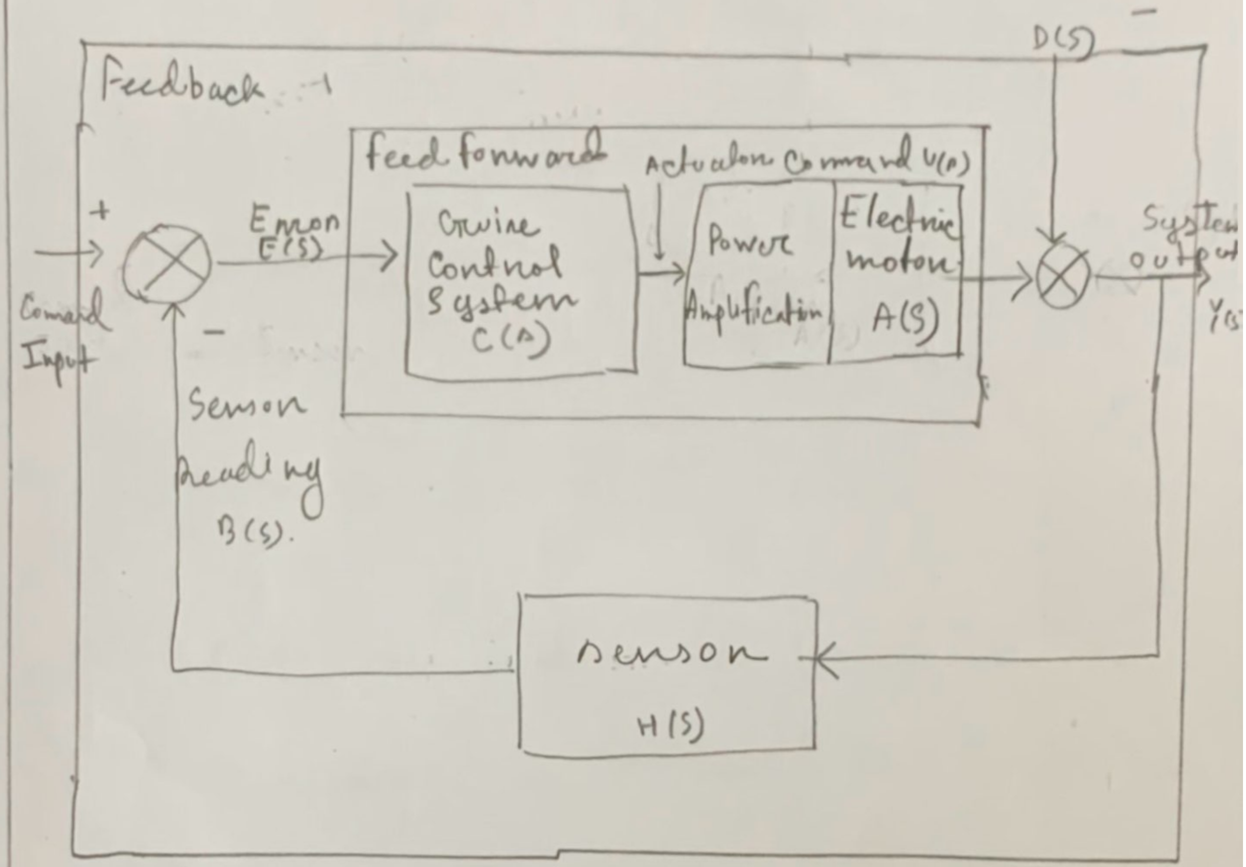
2020108
Adiba.

Ans to the Q. No. a



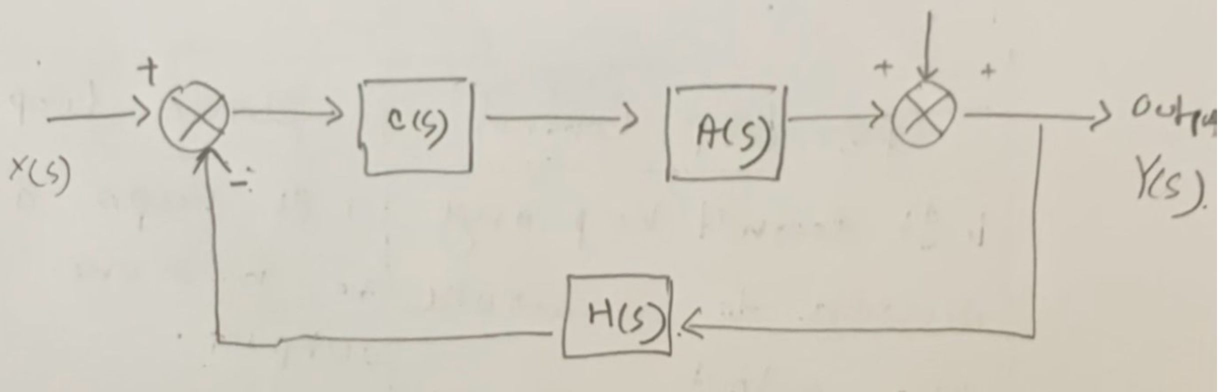
=> from the given passage we can figure this out that ~~is~~ this is a closed loop system as it is receiving the sensor's information.

=> The controller in the cruise control system.

=> The actuator ~~motor~~ is an Electric motor..

=> And the sensor is used to ~~beat~~ sense the car's speed.

Answer to the Q. NO. 9.



=> we can see that the X(S) is in series so it would be C(S) X A(S)

$\rightarrow \boxed{C(S)} \rightarrow \boxed{A(S)} \rightarrow \; = C(S) \times A(S)$

=> for the output it is parallel with the input so it is.

$$C(S) \times A(S) \times H(S).$$

& as the comparator is getting 1 positive sign & 1 negative sign it would be,

$$1 + C(S) \times A(S) \times H(S).$$

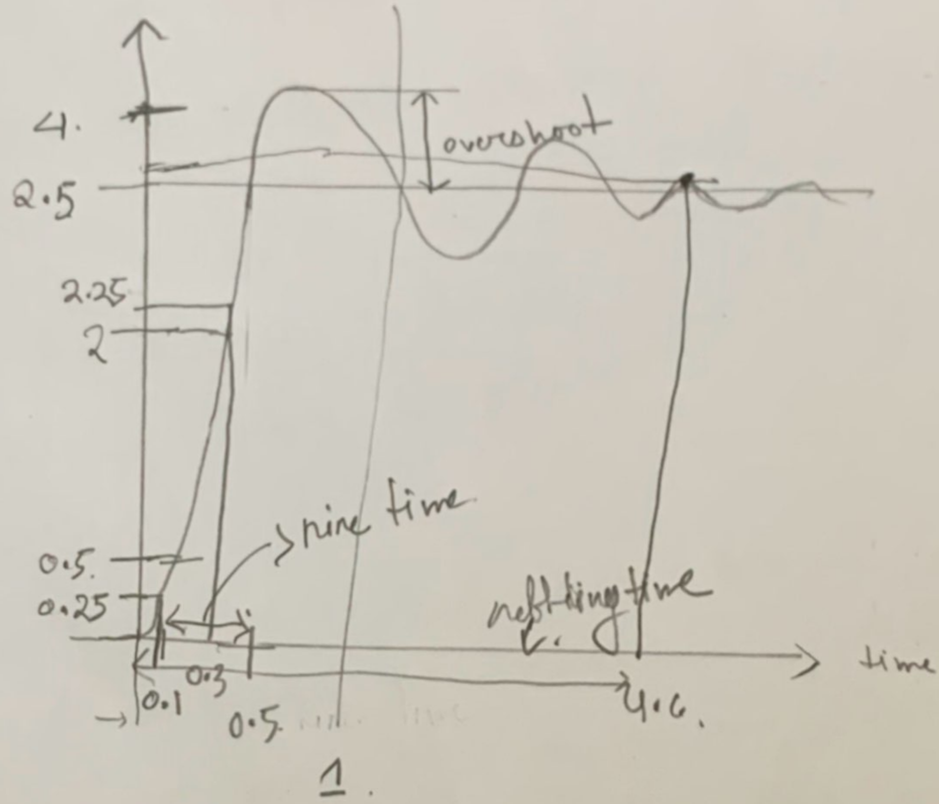
=> So the transfer function is,

$$\text{feedback} = \frac{C(S) \times A(S)}{1 + C(S) \times A(S) \times H(S)}$$

Ans to the Q. No. C.

Open Loop Control	Closed Loop Control
1. It doesn't keep any sensor to measure the output.	1. It keeps a sensor to measure the output.
2. It ~~sends~~ doesn't send the output back to a comparator.	2. It sends the output back to the comparator.
3. The output is lost forever. It can not be tracked or monitored.	3. The output is received & the input signal then is sent ~~by~~ measuring a scale to have desired output
4. The desired output might not be achieved.	4. The desired output will be achieved.
~~5. The feedback~~ 5. No feedback, Thus no controlling the output.	5. Feedback can help reach the desired output & control input.

Ans to the Q. No. d.



<u>Overshoot</u>: Overshoot is the concept that ~~cla~~ calculates the percentage of ~~there~~ what the value is exceeding from the desired value in the first oscilation.

$$\text{overshoot} = \frac{|4-2.5|}{2.5} \times 100\,\%$$

$$= 60\,\%. \quad \text{(Ans)}$$

<u>Rise time</u>: Rise time is the time difference between the 10% of the desired value & 90% of the desired value.

$\Rightarrow$ 10% of desired value = 0.25.

90% of desired value = 2.25.

$t_0 = 0.1$.

$t_1 = 0.3$.

rising time = $0.3 - 0.1 = 0.2$ sec.

(Answer)

Settling time: The time taken for the output to reach within a range of a curve. which peak is touched first in the time to reach settling time.

4% of $2.5 = 0.1$.

$\Rightarrow 2.5 - 0.1 = 2.4$.

$2.5 + 0.1 = 2.6$.

We can see at 2.6 the curve is hit. at 4.6 second

so settling time 4.6 s.

(Ans)