

USN

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Control Theory and Virtual Instrumentation

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Illustrate closed loop control system with example. (10 Marks)
- b. Differentiate open loop control system and closed loop control system with example. (10 Marks)

OR

- 2 a. For the physical system shown below draw its equivalent system and write equilibrium equation. Hence draw its electrical analogous circuit based on i) Force voltage ii) Force current method. (10 Marks)

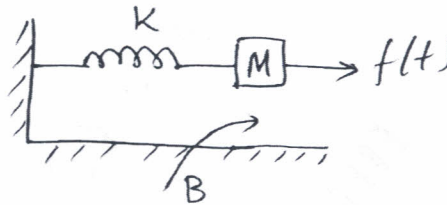


Fig.Q.2(a)

- b. Determine the transfer function $\frac{X_2(s)}{F(s)}$ for the mechanical system. (10 Marks)

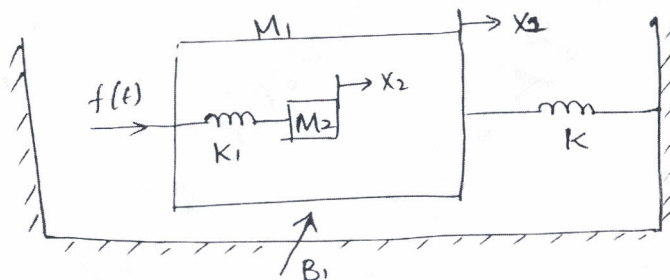


Fig.Q.2(b)

Module-2

- 3 a. Derive the transfer function of closed loop system. (10 Marks)
- b. Determine the transfer function $C(s)/R(s)$ of the system. (10 Marks)

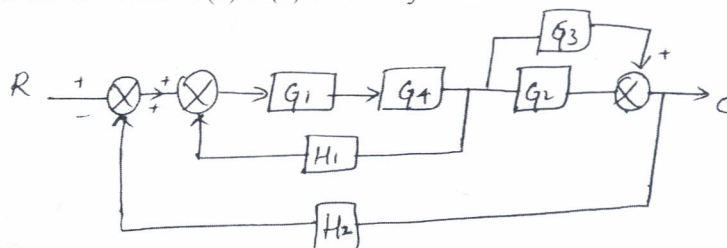


Fig.Q.3(b)

OR

- 4 a. Using block diagram reduction technique find the transfer function:

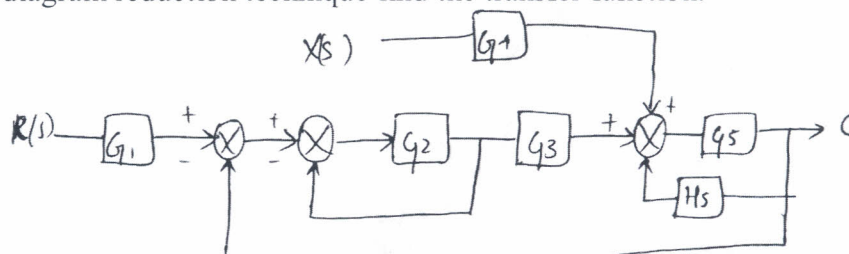


Fig.Q.4(a)

- b. Find the overall T.F (Transfer Function) using Mason's gain formula.

(10 Marks)

(10 Marks)

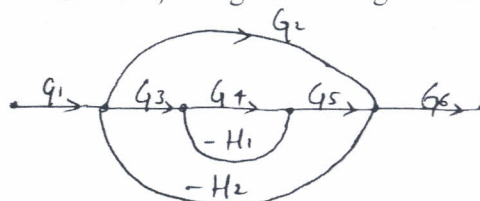


Fig.Q.4(b)

Module-3

- 5 a. Explain the architecture of VI (Virtual Instrumentation) with a block diagram. (10 Marks)
b. Explain the difference between graphical programming and conventional programming. (10 Marks)

OR

- 6 a. Explain PC based data acquisition system with a block diagram. (10 Marks)
b. Explain single ended and differential ended inputs. (10 Marks)

Module-4

- 7 a. Explain the working of for loop and while loop. (10 Marks)
b. Explain any 5 string functions with example. (10 Marks)

OR

- 8 a. Explain case structure and sequence structure with example. (10 Marks)
b. Create a VI to invert the state of a Boolean indicator twice until stop. (10 Marks)

Module-5

- 9 a. Explain CAN BUS architecture with block diagram and its applications. (10 Marks)
b. Briefly explain USB. (10 Marks)

OR

- 10 a. Explain MOD BUS protocol. (10 Marks)
b. Explain ISO-OSI model in detail. (10 Marks)
