BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – Dip.EE-2021
Course Name – Control of Electrical Machine
Course Code - DEE604C
(Semester VI)

Full Marks : 60   **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]
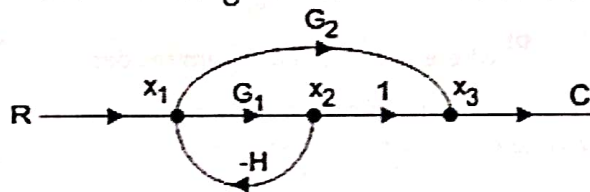
Group-A
(Multiple Choice Type Question)   1 x 15=15

1. *Choose the correct alternative from the following :*

(i)   Use mason's gain formula to calculate the transfer function of given figure:
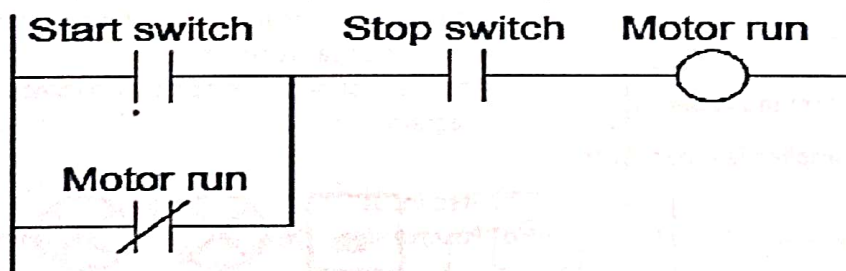

a) G1/(1+G$_2$H)   b) G$_1$+G$_2$/(1+G$_1$H)
c) G$_1$G$_2$/1-G$_1$H   d) G$_1$+G$_2$/(1-G$_1$H)

(ii) Identify the motor control problem in this PLC program

a) coil   b) seal in contact
c) start cotact   d) stop contact

(iii) Select a node that have only outgoing branches

a) Input node   b) Output node
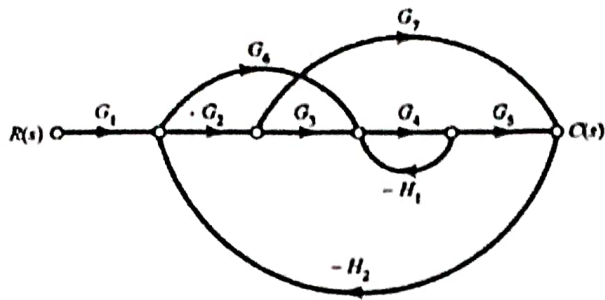c) Incoming node   d) Outgoing node

(iv) Select the advantage of using free - wheeling diode in half controlled bridge converter is that

a) There is always a path for the dc current independent of the ac line   b) There is always a path for the ac current independent of the ac line

c) There is always a path for the dc current dependent of the ac line

d) There is always a path for the ac current independent of the ac line

(v) List out one from the following which is not a manually operated switch.

a) Thumbwheel switch

b) Rotary selector switch

c) Crossbar switch

d) Toggle switch

(vi) A relay working is associated

a) By using a resistor to change the current

b) By using an electromagnet to activate or deactivate a switch or circuit

c) By using a semiconductor technology

d) By using a mechanical switch

(vii) Regenerative feedback associated with

a) positive

b) negative

c) oscillation

d) step

(viii) As a result of introduction of negative feedback identify -------- of the following will not decrease

a) bandwidth

b) oveall gain

c) noise

d) instability

(ix) Identify the main component of a relay

a) capacitor

b) diode

c) contacts

d) coil

(x) Tell that the speed of a DC shunt motor can be increased by

a) Increasing the resistance in armature circuit

b) Increasing the resistance in field circuit

c) Reducing the resistance in the field circuit

d) Reducing the resistance in the armature circuit

(xi) Identify which of the following is the best braking method?

a) Friction

b) Electromechanical action

c) Eddy-currents

d) Electric braking

(xii) Choose the main difference between online and offline PLC programming is

a) whether the programming pc has internet connectivity

b) where the edited program resides

c) whether the PLC is running or stopped

d) the type of program used

(xiii) Identify that the capability of convention relay systems for complex operations is _____ that of the PLCs.

a) excellent than

b) poor than

c) as good as

d) unpredictable as

(xiv) Identify which of the statement is correct for the signal flow graph.

a) They apply to linear systems

b) The equation obtained may or may not be in the form of cause or effect

c) Arrows are not important in the graph

d) They cannot be converted back to block diagram

(xv) Regenerative feedback implies feedback with

a) Oscillations

b) Step input

c) Negative sign

d) Positive sign

Group-B
(Short Answer Type Questions)
3 x 5=15

2. Calculate the overall transfer function for the given signal flow graph. (3)

3. State the advantages of closed-loop control system over open-loop control system. (3)
4. List out the main features of MCB. (3)
5. Identify the differences between Contactor and MCB. (3)
6. Write advantages and disadvantages of automatic star delta starter. (3)

OR

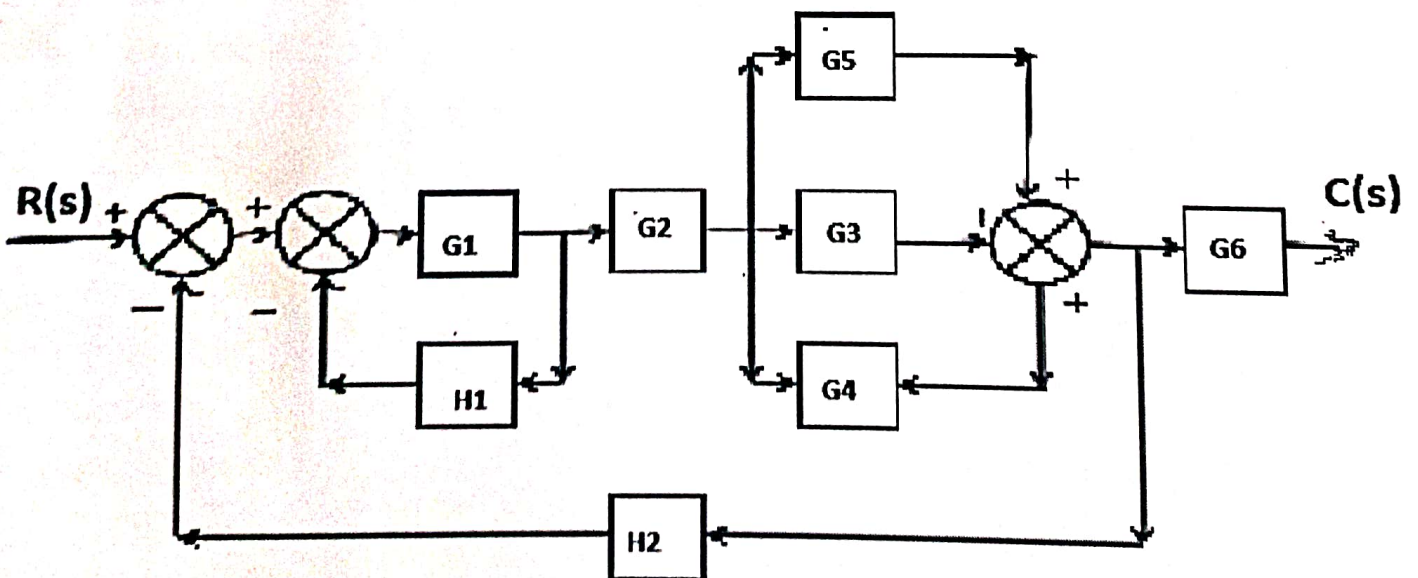Illustrate the operation ON-OFF motor control circuit with necessary diagram. (3)

Group-C
(Long Answer Type Questions)

5 x 6=30

7. Explain the function of voltage operated overload relay. (5)
8. Describe the working of definite time acceleration starter (5)
9. Differentiate between Fuse and MCB. (5)
10. Evaluate the overall gain of the given graph. (5)
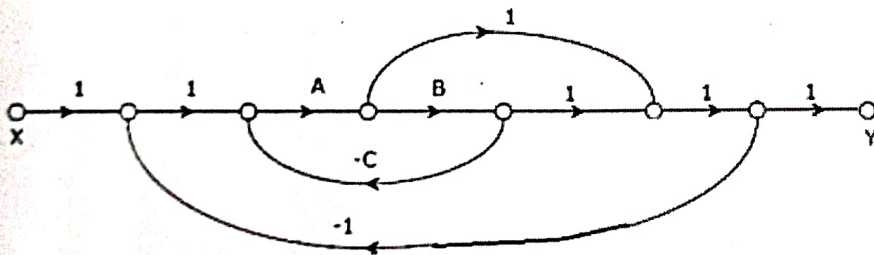
11. Explain the main function of each of the major components of a PLC. (5)
12. Derive the transfer function. (5)

(5)

Derive the transfer function of

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