

17536

11920

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. (A) Attempt any THREE : 12
- (i) State need of PLC in automation. List any four benefits of PLC in automation.
 - (ii) Draw the Block diagram of DC output module and explain threshold detector block in it.
 - (iii) List the timer instructions of PLC. Explain any one of them in detail.
 - (iv) Write the expression of proportional controller and define :
 - (1) Proportional Band
 - (2) Offset
- (B) Attempt any ONE : 6
- (i) Derive the expression for steady state error (ess). State two factors on which it depends.
 - (ii) Compare fixed and modular PLC. (any six points)

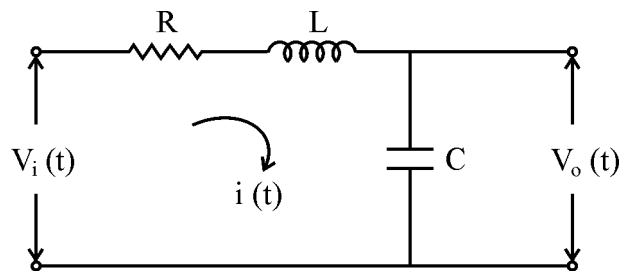
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P.T.O.

5. Attempt any FOUR :

16

- Define stable and unstable system with its response and locations of roots in S-plane.
- List different standard test signals. Draw them and give their Laplace representation.
- Explain in brief ON-OFF control action.
- Derive the transfer function of given electrical circuit.



- Draw the ladder diagram for (i) NAND gate, (ii) NOR gate.

6. Attempt any FOUR :

16

- Describe sinking and sourcing concept in DC input module with neat diagram.
- Draw the block diagram of PLC and explain each block in it.
- Explain PI control action. State its equation. State limitations of PI controller.
- Define with example :
 - Linear and Non-linear system.
 - Time varying and Time in varying system.
- Explain Routh's stability criterion for two different cases.
- Draw block diagram of DC input module. Draw typical wiring diagram of it.