

Time : 3 Hrs.

Note :

1. Part 'A' may be attempted in first 5 pages of Answer Sheet.
भाग 'क' के सभी उत्तर, उत्तर-पुस्तिका के प्रथम पांच पृष्ठों में ही करने हैं।
2. Part 'B' in rest of the Sheets of Answer Sheet.
भाग 'ख' के उत्तर, उत्तर-पुस्तिका के अगले शेष पृष्ठों में लिखिये।
3. Answers may be given in English or Hindi.
प्रश्नों के उत्तर अंग्रेजी अथवा हिन्दी में दीजिये।

Part 'A'

10x2= 20

1. Attempt any 10 questions:

- (i) ~~What is linear control system?~~
- (ii) ~~List advantages of adaptive control system.~~
- (iii) ~~What is pole and zero?~~
- (iv) ~~How do you define ZOH?~~
- (v) ~~Define discrete system.~~
- (vi) ~~How do you define closed loop control system? How it is different from open-loop control system?~~
- (vii) ~~Define micro-processor.~~
- (viii) ~~Why do we require sampling of data?~~
- (ix) ~~Define transfer function~~
- (x) ~~What is time variant and time invariant system?~~
- (xi) ~~Define lead lag compensation.~~
- (xii) ~~Explain model reference control system.~~
- (xiii) ~~How pole and zero decides that the system is stable or not?~~

2. Attempt any 5 questions:

5 x 4= 20

- (i) Give the advantages and disadvantages of canonical variable.
- (ii) Explain in z-transform theorem, Shannon's sampling theorem.
- (iii) Explain bilinear transformation.

- (iv) Write short note on second method of liapunov stability.
- (v) Explain asymptotic stability and instability.
- (vi) Explain in detail block diagram of sampled data and its analysis with samples.
- (vii) Define series and feedback compensation.
- (viii) Derive state transition matrix with suitable example.

PART-B

3 X 20 = 60

Attempt any 3 questions:

- 3 (a) Explain stepper motor variable reluctance.
(b) What is the effect of additional zero and pole lead compensation?
- 4 (a) Prove that the solution of state equation is unique.
(b) Differentiate between the SISO and MISO systems.
- 5 (a) Explain the models of MIMO system.
(b) What is non-linearity and explain different types of non linearities?
- 6 (a) Explain the duality between controllability and observability.
(b) Explain the following:
 - (i) Matrix Representation
 - (ii) Transfer function representation.