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53 (IE 702) INSC

2019

INSTRUMENTATION SYSTEM COMPONENTS

Paper : IE 702

Full Marks : 100

Time : Three hours



**The figures in the margin indicate
full marks for the questions.**

Answer **any five** questions out of 7.

1. (a) Explain the construction and working of synchro pair. 14
(b) Explain check valve. 6

2. (a) Explain the construction and working of an AC tachogenerator. 10
(b) With an example, explain a multistage valve. 10

Contd.

3. (a) Explain the modes of operation of stepper motor. 14

(b) Explain an angular positioning device. 6

4. (a) Design an analog controller having the output voltage:

$$V_{out}^{(t)} = 4V_e^{(t)} + 0.5 \int V_e^{(t)} dt + 10 \frac{dV_e^{(t)}}{dt} + V_{out}^{(o)}$$

Assume all capacitance as $1\mu F$ and $f_{maxi} = 1kHz$. 14

(b) Draw a pneumatic PI controller. 6

5. (a) With a neat diagram explain pneumatic P controller. Derive its transfer function. 14

(b) Design an analog P controller using the controller parameter $G_P = 8$. 6

6. With a neat diagram, explain hydraulic system. Also explain the construction and working of any two types of valve used in this system. 20

7. Write short notes on: 4x5=20

(a) Analog controller

(b) Pneumatic controller

(c) 3-way spool valve

(d) Pneumatic system.

