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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 **seven**.

1. (a) Explain the construction and working of an angular positioning device without a feedback. 14
- (b) Explain an angular positioning device having a feedback. 6
2. (a) Explain Synchro generator. 6
- (b) Explain flapper valve. Derive its pressure ratio expression. 14

Contd.

3. (a) With an example, explain multi-stage valve. 8
 (b) Explain a 3-way spool valve. 6
 (c) Draw an electronic PD controller. 6
4. (a) Explain pneumatic PD controller. Derive its output expression. 14
 (b) Explain a 2-way spool valve. 6
5. (a) Design a controller having the parameters : $G_P = 4$, $G_D = 8$ and $G_I = 0.4$. Assume all capacitance as $1\mu F$ and $f_{max} = 1kHz$.
 (b) Draw a pneumatic PID controller. 6
6. (a) Explain the construction and working of an AC tachogenerator. 10
 (b) Explain two-stage hydraulic valve using flapper valve and 3-way spool valve. 10



7. Write short notes on : 5x4=20
 (a) Check valve
 (b) Error detector for angular position
 (c) Controller
 (d) Control transformer.
