53 (IE 605) PICN

2016

PROCESS INSTRUMENTATION AND CONTROL

Paper : IE 605

Full Marks : 100

Time : Three hours

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

Answer ***any five*** *questions.*

1. *(a)* What are the dynamic performance characteristics of an Instrument ? 10

   (b) How the electrical instruments are classified and give some examples ? 10

2. *(a)* Define the term Transducers and what are its types, with suitable example. 8

(b) Describe the characteristics of P, PI and PID controller modes. 12

3. (a) Explain the construction of pneumatic and electronic controllers. 10

(b) Write the operating principle of pneumatic control value. 10

4. Write short note on the operation of the following process with neat block diagrams.

(a) Drying process

(b) Heat exchanges 20

5. (a) Differentiate interacting system from non-interacting system. 6

(b) Define the term open loop system and closed loop system with the example. 4

(c) Derive the expression and draw the response of the first order system with unit step input. 10

6. *(a)* Using Routh criterion determine the stability of the system whose characteristics equation is $s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$. Comment on the location of the roots of characteristics equation. 10

(b) Explain the time domain characteristics of a second order system for unit step input. 10

7. *(a)* Explain about Signal Flow Graph. 10

(b) Find the overall transfer function of the system shown in *Figure (1)*. 10

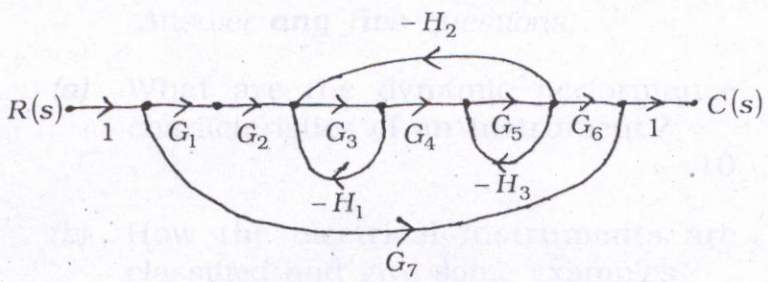

Figure (1)