Reg. No. :

Question Paper Code : 90401

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019
Fourth Semester
Mechanical Engineering (Sandwich)
MS 8401 – INSTRUMENTATION AND CONTROL SYSTEMS
(Regulations 2017)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions

PART – A   (10×2=20 Marks)

1. What is calibration ?

2. Define rosette.

3. State two difficulties in measurement of high resistance.

4. List the merits of resistance temperature detector.

5. What is the principle of electromagnetic flow meter.

6. List any two important criteria to consider during selection a sensors.

7. Why negative feedback is invariably preferred in a closed loop system ?

8. Write the transfer function of PID controller.

9. List the standard test signal used in the control system.

10. Compare DCS and SCADA.

90401   -2-

PART – B   (5×13=65 Marks)

11. a) i) Explain detaily any four static characteristics of instruments. (8)

     ii) List the factors considered in selection of instruments. (5)

(OR)

   b) i) Give a brief note on strain. (3)

     ii) With proper diagram, explain construction and orientation of strain gauge. (10)

12. a) i) Explain piezo-electric instrument for acceleration measurement. (7)

     ii) Explain liquid in glass thermometer for temperature measurement. (6)

(OR)

   b) With neat sketches, explain the principle, different forms of construction, resistance-temperature characteristics and applications of thermistor. (13)

13. a) i) Explain any one low pressure measuring instrument. (8)

   ii) Short note on elastic diaphragm transducer. (5)

(OR)

   b) Illustrate the principles, construction, different types and application of hot wire anemometer. (13)

14. a) i) Describe important elements in the closed loop control system with example. (9)

     ii) Short note on multi variable control system. (4)

(OR)

   b) Using block diagram reduction technique find the transfer function of $Y(s)/R(s)$ for the system given below. (13)
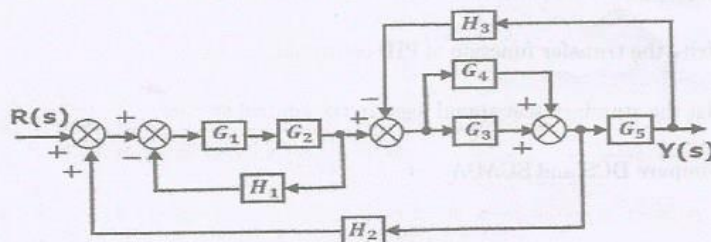
*Available in /*AllAbtEngg *Android App too,*

Check www.SmartPoet.Net *&* www.PhotoShip.Net

15. a) i) Construct Routh array and determine stability of the system represented by the characteristics equation $s^5 + s^4 + 2s^3 + 2s^2 + 3s + 5 = 0$. Command on the location of roots of characteristics equation. (7)

   ii) Derive the response of the first order system for unit step input. (6)

(OR)

   b) Explain the architecture, communication facility and interface of distributed control system. (13)

PART – C   (1×15=15 Marks)

16. a) i) Explain construction, characteristics, applications, merits and demerits of LVDT. (8)

   ii) Explain any one method for measuring very high temperature. Provide diagrams. (7)

(OR)

   b) i) Explain architecture, tag logging and report generation of SCADA System. (10)

   ii) Short note on different types of SCADA Protocols. (5)