21415

3 Hours/100 Marks   Seat No. ☐☐☐☐☐☐☐

Instructions :   (1) **All** questions are **compulsory**.
        (2) Illustrate your answers with **neat** sketches **wherever** necessary.
        (3) Figures to the **right** indicate **full** marks.
        (4) **Assume** suitable data, if **necessary**.

                                                                                 MARKS

1. A) Attempt **any three** :   **(4×3=12)**

    a) Define instrumentation. Explain functional elements of instruments.

    b) State principle of radiation pyrometer. Draw neat sketch of optical pyrometer.

    c) Enlist direct and indirect method of level measurement. Explain air purge method.

    d) Describe principle of thermal flow meter.

  B) Attempt **any one** :   **(6×1=6)**

    a) Explain cascade control with block diagram.

    b) Explain with neat sketch, LVDT.

2. Attempt **any four** :   **(4×4=16)**

    a) Describe bourdon tube pressure gauge.

    b) Write short note on valve sizing (any two points).

    c) Identify the benefits of using PLCs for industrial applications.

    d) Explain the factors to be considered while going for valve selection (4 points).

    e) Explain with neat sketch pneumatic proportional controller.

    f) Describe distributed control system.

3. Attempt **any four** :   **(4×4=16)**

    a) Give the principle of magnetic flow meter.

    b) Draw neat sketch of following level measuring methods.

        a) Radioactive method

        b) Capacitive method.

c) Compare the performance of P, PI, PD and PID controller.

d) Describe with neat sketch resistance temperature detector.

e) Explain different types of pressure.

4. A) Attempt **any three** : **(4×3=12)**

   a) State principle of thermocouple. Draw neat sketch of it.

   b) Explain sources of error in mercury filled glass thermometer.

   c) State principle of piston type flowmeter. Draw neat sketch of it.

   d) Describe the working of flow nozzle with diagram.

   B) Attempt **any one** : **(6×1=6)**

   a) Enlist types of control valve. Give the function of valve actuator.

   b) Explain :
      1) Features of DCS.
      2) Advantages of DCS.

5. Attempt **any four** : **(4×4=16)**

   a) Convert 2.5 bar into
      1) Pa
      2) Psi.

   b) Describe in detail any one type of solid level measurement.

   c) Explain in detail ultrasonic method of level measurement.

   d) State principle of Mcleod gauge. Draw neat sketch of it.

   e) State principle of ultrasonic flowmeter. Draw neat sketch of ultrasonic flowmeter.

6. Attempt **any two** : **(8×2=16)**

   a) Explain valve characteristics.

   b) Describe Programmable Logic Controller (PLC) architecture.

   c) Differentiate open and closed loop system (8 points).

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