**(3 HOURS)**  **[TOTAL MARKS: 80]**

Note:

1. Q.1 is compulsory. Attempt any three questions from Q.2 to Q.6
2. Figures to the right side indicates marks
3. Assume suitable data if required.

| | | |
|---|---|---|
| 1-A) | Compare Analog with Digital Sensors. | **5** |
| 1-B) | Explain Artificial Muscle materials. | **5** |
| 1-C) | Draw and explain Hall Effect Sensor. | **5** |
| 1-D) | Enlist Classification of a Stepper motor. | **5** |
| | | |
| 2-A) | State and explain Static characteristics of Sensors used for measurement. | **10** |
| 2-B) | Draw and explain strain gauge based and piezoelectric accelerometers. | **10** |
| | | |
| 3-A) | State different types of Transducers for displacement measurement. Explain LVDT. | **10** |
| 3-B) | Compare Ultrasonic Flowmeter with Magnetic flow meter. Draw suitable diagrams. | **10** |
| | | |
| 4-A) | What is mean by Special Sensors? Explain Chemical Sensors. | **10** |
| 4-B) | Draw block diagram of DC motor drive. Explain each block in detail | **10** |
| | | |
| 5-A) | Draw & explain induction motor characteristics. | **10** |
| 5-B) | With neat diagram explain Piezoelectric transducers. | **10** |
| | | |
| 6-A) | Draw & explain Components of pneumatic system. | **10** |
| 6-B) | What are the factors to be Considered while selection of actuator. | **10** |

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