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- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.
 11. Use of non programmable calculator is permitted.

1. a) What are the key elements of typical mechatronics system? Explain with the help of diagram. 7
b) Explain different types of control system with suitable example. 6

OR

2. a) What is automatic car parking system? Explain the operation of this system with block diagram. 7
b) Explain the elements of a measurement system. 6
3. a) What is data acquisition system? Give its types. Explain any one with block diagram. 7
b) What is digital signal processors (DSPs). Explain with block diagram. 7

OR

4. a) Explain interfacing microcontroller outputs with Actuators. 7
b) State the modes of serial communications. Explain any one. 7
5. a) Explain the principle and working of d.c. motor with neat sketch. 7
b) State the types of stepper motor? Explain any one in brief. 6

OR

6. a) Explain the working of rectifier drive with help of block diagram. 7
b) Explain rotary actuator with neat sketch. 6

7. a) What is meant by logic gate? State the types of logic gates. Explain with truth tables. 7
b) Draw and explain the architecture of 8085 microprocessor. 7

OR

8. a) Explain the buses in 8085 microprocessor. State the types of buses in 8085 microprocessor. 7
b) Convert the following. 7
i) $(105)_{10} = ()_2$
ii) $(365.24)_8 = ()_{10}$
iii) $(A3B)_H = ()_{10}$
9. a) Draw and explain the block diagram of PLC. 7
b) Explain shift register's with suitable diagram. 6

OR

10. a) Explain master control relay functions with reference of PLC. 7
b) Explain the control of vibrating machine with the help of PLC. 6
11. a) Explain the working of TTL logic. 7
b) Describe evaluation and benefits of SCADA. 6

OR

12. a) Explain in brief motor isolation schemes. 7
b) Explain MEMS based pressure sensor in brief. 6
