B.E. (Mechanical Engineering) Sixth Semester (C.B.S.)

Mechatronics

P. Pages : 2 **TKN/KS/16/7485**

Time : Three Hours * 0 8 3 7 * Max. Marks : 80

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 various steps involved in designing of mechatronics system? Explain in detail. **7**

b) Define sensor and explain the working of any one in detail. **6**

OR

2. a) Discuss the possible solution for designing of car engine management mechatronics system. **7**

b) With a neat sketch explain open loop and closed loop control system. **6**

3. a) Explain block diagram of data acquisition system (DAQS). **7**

b) What is digital communication? Explain any one. **6**

OR

4. a) Explain the concept of DSP in a mechatronics system with suitable example. **7**

b) State the significance of "Interfacing" the hardware in a mechatronics system. **6**

5. a) Explain the working of solenoid and relay used in electrical actuating system. **7**

b) Differentiate between stepper and servomotor. **7**

OR

6. a) With the help of neat sketch explain the working of pressure control valve. Also state its applications. **7**

b) Draw and explain circuit diagram of thyristor and triac. **7**

7. a) What is mean by logic gates? Explain the various logic gates with truth table. **7**

b) Obtain the following conversions. **6**

i) $(110110)_{\text{Binary}} = (?)_{\text{decimal}}$

ii) $(48)_{\text{decimal}} = (?)_{\text{Binary}}$

iii) $(10101)_{\text{Binary}} = (?)_{\text{decimal}}$

OR

8. a) Differentiate between micro – controller and micro processor and draw a block diagram of basic μp. **6**

b) Draw and explain the architecture of 8085 micro – controller. **7**

9. a) Explain the role of vibrating machine with the help of PLC. **7**

b) Explain any five aspects to be considered for the selection of PLC for given application. **6**

OR

10. a) Explain shift registers with suitable diagram. **7**

b) State the common PLC programming method. Explain any one method in brief. **6**

11. a) Explain in brief motor isolation schemes. **7**

b) State the importance of 'MEMS' in design process and explain the working of ' Accelerometer ' in MEMS application. **7**

OR

12. a) Explain CMOS and Sensor interfacing in detail. **7**

b) Explain the working of TTL logic. **7**

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