Faculty of Engineering & Technology

Sixth Semester B.E. (Mechanical Engg.) (C.B.S.) Examination

MECHATRONICS

Time—Three Hours] [Maximum Marks—80

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Solve **SIX** questions as follows :

- Que. No. **1 OR** Que. No. **2**
- Que. No. **3 OR** Que. No. **4**
- Que. No. **5 OR** Que. No. **6**
- Que. No. **7 OR** Que. No. **8**
- Que. No. **9 OR** Que. No. **10**
- Que. No. **11 OR** Que. No. **12**

(3) Due credit will be given to neatness and adequate dimensions.

(4) Assume suitable data wherever necessary.

(5) Diagrams and Chemical equations should be given wherever necessary.

1. (a) Explain the scope and elements of Mechatronics. 7

(b) Explain the role of Mechatronics systems in measurement of different mechanical parameters with suitable examples. 6 6

OR

2. (a) Differentiate between open loop and close loop system. Explain the characteristics of close loop system. 6

(b) Describe role of Mechatronics in ABS. 7

3. (a) Explain the concept of Data Acquisition System in detail. 7

(b) Distinguish between parallel communication and serial communication. 6

OR

4. (a) What is stepper motor ? Explain the working of hybrid stepper motor with the help of suitable example. 7

(b) How peripheral devices are interfaced to the microprocessor using software and hardware approach ? 6

5. (a) Explain different types of mechanical switches and relays used in electrical actuating systems. 7

(Contd.)

(b) Write short note on PWM (Pulse Width Modulation). 7

OR

6. (a) Explain the Brushless permanent magnet d.c. motor with suitable example. 7

(b) Explain with proper diagram working of spool valve. 7

7. Explain with suitable block diagram the working of 8085 µp. State its characteristics and application with reference to mechanical system. 13

OR

8. (a) Convert the following :

(i) $(A08F.EA)_{16} = (\ ?\ )_{10} = (\ ?\ )_{8} = (\ ?\ )_{2}$

(ii) $(1101101101101.101101)_{2} = (\ ?\ )_{16} = (\ ?\ )_{10}$ 6

(b) Explain various types of logic gates used in digital electronic circuits with proper symbols. 7

9. (a) With the help of flow chart explain operating principle of PLC. 7

(b) Draw a ladder diagram with programming of two pneumatic piston. 6

OR

10. (a) Draw and explain Architecture of PLC. 7

(b) Explain internal relay and timer counter with suitable examples using ladder diagram in PLC. 6

11. (a) Describe SCADA with suitable example. 7

(b) Explain CMOS and sensor interfacing in detail. 7

OR

12. (a) Explain working of TTL logic. 7

(b) Draw and explain MEMS with its application. 7

1680
7272
140
75
800
500
1700
12167