

Mechatronics

P. Pages : 2

Time : Three Hours

**NRJ/KW/17/4537**

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) Draw & explain block diagram of mechatronics system. 7
- b) Differentiate between open loop & closed loop control system. 6

OR

2. a) Explain various elements of measurement system? 6
- b) Explain working of coin counter? 7
3. a) Explain data logger system along with it's characteristics & Applications. 8
- b) Explain modes of serial communication? 6

OR

4. a) Explain in detail variable frequency drives (VFD)? 7
- b) Explain interfacing requirements for microprocessor? 7
5. a) State different types of stepper motor. Explain any one in brief? 7
- b) Draw & explain characteristics of Thyristor & triac with circuit diagram? 6

OR

6. a) Explain working of pressure control valve? Also state it's applications. 7
- b) Explain rotary Actuator with neat sketch? 6
7. a) Draw & explain Architecture of 8085 μ p? 8

- b) Obtain the following conversions. 6
- $(4161)_8 = (?)_2$
- $(ABCD)_{16} = (?)_8$
- $(1010.011)_2 = (?)_{16}$

OR

8. a) Explain all logic gates with truth table & symbols? 6
- b) Reduce the function using k-map & express in SOP & POS forms 8
 $f(A, B, C, D) = \Sigma m(0, 1, 2, 3, 5, 7, 8, 9, 10, 12, 13)$?
9. a) State common PLC programming methods? Explain any one method in brief? 6
- b) Draw & explain internal architecture of PLC in detail? 7

OR

10. a) Explain different timers used in PLC? 6
- b) Explain control of process water tank with ladder diagram? 7
11. a) Differentiate between TTL & CMOS logic family? 6
- b) Explain in brief motor isolation schemes? 7

OR

12. a) Draw & explain general block diagram of MEMS? State its advantages? 7
- b) Describe functionality & benefits of SCADA? 6
