

MODEL QUESTION PAPER
13.506.5 MECHATRONICS (TA)

Time:3Hrs

Max.Marks:100

Part A

(Answer all Questions .Each carries 2 Marks)

1. Define Mechatronics. list the applications of Mechatronics in day to day activities.
2. What are the requirements of a control system.
3. List the advantages and disadvantages of CNC systems
4. List some of the types of CNC machine tools
5. A tachometer generator is used to measure the speed of rotation of IC engines has a ideal rating
Of 6V/1000rpm, a range of 0-4000rpm and an accuracy of +/- 0.4%. If output of tachogenerator
Is 18 V. What is the ideal value of the speed. What are the minimum & maximum possible values of speed.
6. List the applications of fluid power systems
7. Draw the block diagram illustrating the general configuration of DNC system
8. What do you mean by point to point programming
9. What are the selection criteria for PLC
10. Define CAD, CAM & CIM

PART B

(Answer One question of each module Each question carries 20 marks)

Module 1

11. What are the different phases in Mechatronic design process. Also what do you mean by integrated design approach. Explain how an ABS system works in vehicles. (20 marks)

12. Write note on CNC machines, types of CNC system. Also give a comparison of conventional, NC &

CNC systems

(20 Marks)

Module 2

13 a) With diagram illustrate the physical components in hydraulic systems (10 marks)

b) Determine the force needed to apply to a piston of 2cm in radius in order to result a force of

6000N at the working piston of radius 6cm. Calculate the hydraulic pressure (5 marks)

c) Give the specifications of a typical stepper motor (5 marks)

14 a) Design a 3bit synchronous counter (10 Marks)

b) Write notes on i) linear & circular interpolator

ii) encoders & decoders (10 marks)

Module 3

15) a) Write note on DNC. Explain the types of DNCs. (15 marks)

b) List the selection criteria for a DNC (5marks)

16 a) Explain in detail the elements involved in a CIM system (8 marks)

b) Explain in detail Automated storage / Retrieval system and explain the basic components

in such systems

(12 marks) .

Module 4

17. a) Write note on Retrieval computer aided process planning system (10marks)

b) Write note on CIM production planning system (10 Marks)

18 Develop a code for machining hexagonal bolt from a metal block so that the code can be fed into

CNC machine. (20 marks)