

**B.E DEGREE EXAMINATIONS: NOV/DEC 2010**

Fifth Semester

**MECHATRONICS ENGINEERING**

U07MH504: CNC Technology

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all questions:-**

**PART A (10 x 1= 10 Marks)**

1. Which is the CNC hardware  
a) microprocessor      b) PLC      c) feed drive      d) servo control
2. Pick odd man out  
a) Resolver      b) Encoder      c) Feed motor      d) Linear scale
3. Which are primarily employed in feed mechanism of a CNC machine?  
a) Ball Screw      b) Ball bearing      c) Ball grip      d) Ball bush
4. What is the helix angle of ball screw?  
a) (2 ° -5°)      b) (13 ° -15 °)      c) (17 ° -20 °)      d) (7 ° -10v)
5. Rockwell hardness value for cemented carbide?  
a) 82 – 85 HRC      b) 90 – 93 HRC      c) 56-59 HRC      d) 61 – 64 HRC  
d) Good conductor of electricity
6. What is the principle used for locating a work piece in jig  
a) Four point location      b) 2-3-1 principle      c) six point location      d) 1-2-3 principle
7. Write down the G –code for parabolic interpolation  
a) G50      b) G70      c) G06      d) G 54
8. Write down the M- code for spindle stop  
a) M76      b) M04      c) M05      d) M06
9. Which one is called as overhead cost?  
a) Material Cost      b) Labor cost      c) Logistic cost      d) Machine maintenance cost
10. Which knowledge is required for arithmetic and geometric operations in CNC system?  
a) Machine operation      b) Programme editing      c) Mathematics      d) Spatial visualization

**PART B (2 x 10 = 20 Marks)**

11. Define CNC
12. In what way CNC lathes are superior to automatic lathes.
13. Write a note on backlash measurement and compensation.
14. What are all the requirements of spindle in CNC machine?
15. State the different types of measuring systems in CNC machines.

16. State any 4 features that an ideal working holding device would pass for CNC applications?
17. What do you know about APT program structure?
18. What is meant by CAPP?
19. What are all the factors which influence the selection of CNC machines?
20. Write a note on the importance of training in maintenance of CNC machines.

**PART C (5 x 14 = 70 Marks)**

21. a) (i) With a suitable schematic diagram, discuss the fundamental aspect of CNC machine control. (10)  
(ii) Write any two advantages and disadvantages of CNC machines? (4)  
**(OR)**
- b) Discuss different types of CNC machine and its features relevant to different applications.
22. a) With a suitable diagram explain a typical CNC spindle axis drive motors with their salient functional features.  
**(OR)**
- b) (i) What are the classifications of ATC and explain briefly with a neat sketch. (8)  
(ii) Discuss the features of the retrofit machine. (6)
23. a) Discuss the principle operation of resolver and linear optical encoder with suitable sketches.  
**(OR)**
- b) What are the different types of control systems available in NC machine tools and explain any two.
24. a) Discuss the major steps involved in generating NC part programs  
(i) using APT  
(ii) from CAD model  
**(OR)**
- b) Write a note on the following with suitable sketches and examples  
(i) Circular interpolation in turning  
(ii) Fixed drilling cycle on machining centers
25. a) What are three factors influencing the selection of CNC machines.  
**(OR)**
- b) (i) What are the preventive measures to maintain the CNC machine. (7)  
(ii) Write a note on the practical aspects of introducing the CNC machine. (7)

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