ACHARYA INSTITUTE OF TECHNOLOGY
Bangalore - 560090

USN | | | | | | | | | | |

10MA64

Sixth Semester B.E. Degree Examination, Dec.2016/Jan.2017
CNC Machines

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain with the help of a block diagram a CNC machine and state the advantages of CNC machines. **(12 Marks)**

b. Explain with the help of schematic sketch the concept of absolute dimensioning and incremental dimensioning. **(08 Marks)**

2 a. Explain with the help of a block diagram open loop and closed loop systems. **(10 Marks)**

b. Explain with the help of sketches the following:
i) Positioning cum straight cut system ; ii) Continuous path system. **(10 Marks)**

3 a. What is interpolation? Explain with the help of sketches linear interpolation and circular interpolation. **(12 Marks)**

b. List and describe the various tape formats in NC, with suitable example. **(08 Marks)**

4 a. List the requirements of CNC feed drive. **(06 Marks)**

b. Sketch and explain the servo mechanism with techno feed back in machine tool control. **(10 Marks)**

c. What are the selection criteria for AC drives? **(04 Marks)**

PART – B

5 a. Write notes on timer belts with a sketch. List the advantages of timer belts. **(08 Marks)**

b. With the help of a neat sketch, explain the working principle of circulating ball screws. **(12 Marks)**

6 a. Explain briefly the two types of automatic tool changers with simple sketch. What is the time normally taken for a tool exchange? **(08 Marks)**

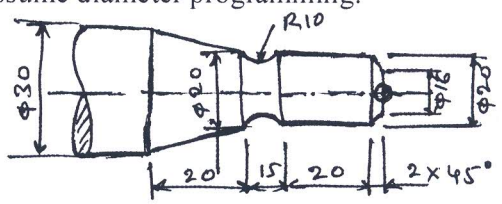
b. What are the main constituents of an FMS system represent it in a tree diagram? **(08 Marks)**

c. List the benefits of FMS. **(04 Marks)**

7 a. With a line diagram, explain the steps involved in computer assisted part [programming]. **(08 Marks)**

b. Write a program in G and M codes to turn the outside diameter of the component shown in Fig.Q.7(b). Assume spindle speed of 1000 rpm and feed rate of 150 mm/min. The component should be turned in one cut using tool number 05 and tool off set no. 025. All dimensions are in mm. Assume diameter programming. **(12 Marks)**

Fig.Q.7(b)



8 Explain any four of the following:

a. Rigidity testing on CNC machine
b. Purpose of ATP statements.
c. Idle power.
d. Metal removal capability test.
e. Safety aspects for CNC machine. **(20 Marks)**

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