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14MAR23

# Second Semester M.Tech. Degree Examination, June/July 2016
## Computer Control of Manufacturing Systems

Time: 3 hrs. Max. Marks:100

**Note: 1.** ***Answer any FIVE full questions.***
**2.** ***Assume missing data suitably.***



1 a. Explain with neat sketch the product cycle with CAD/CAM overlaid. **(10 Marks)**
b. What is CIMS? Explain the functions of computer in CIMS. **(10 Marks)**

2 a. Explain with a neat sketch the different components of a hydraulic system. **(10 Marks)**
b. Briefly explain the incremental and absolute encoders used for rotary position measurement with neat sketches. **(10 Marks)**

3 a. With help of a block diagram explain the working of incremental closed loop control of a point to point system. **(10 Marks)**
b. Explain the principle of operation of a control loop in the contouring system. **(10 Marks)**

4 a. Explain the neat sketches the tool changing procedure in an ATC (Automatic Tool Change) having durable gripper. **(12 Marks)**
b. With neat sketch describe any two work holding devices used in CNC machine tools. **(08 Marks)**

5 a. Write the functions associated with the following G and M codes cost FANUC controllers.
i) G03 ii) G04 iii) G41 iv) G80 v) G91 vi) M02 vii) M06 viii) M98 **(08 Marks)**
b. Examine the following CNC part program for a machining centre equipped with a FANUC controller. Identify any errors found in the program and explain the errors.
Prepare the geometry of the part generated if the diameter of the slot drill used is 10mm.

```
[BILLET O 7001 X    Y  Z
        N1  G71
        N2  G90
        N3  T1 M6
        N4  G0 X75 Y 100
        N5  G1 Z - 3
        N6  X175 F100
        N7  Y25
        N8  X75
        N9  Y100
        N10 M30.
```

**(12 Marks)**

6 a. Explain the functions of a Computer Numerical Control (CNC). **(10 Marks)**
b. What is DNC? With a neat sketch explain a general DNC system. **(05 Marks)**
c. Explain in brief the sources of variability in machining where adaptive control can be most suitably applied. **(05 Marks)**

7 a. With a neat sketch list the physical 6 DOF in robot motion. **(08 Marks)**
b. Explain in brief the sensors used in Robots. **(06 Marks)**
c. Briefly explain the 4 methods used for programming a robot. **(06 Marks)**

8 a. Explain with a block diagram the variant CAPP system. **(10 Marks)**
b. List and explain the steps involved in shop floor control system. **(10Marks)**

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