Student Exam. No._____

# GANPAT UNIVERSITY

## B.TECH. SEM. VIII[TH] MECHANICAL ENGINEERING

## REGULAR EXAMINATION MAY/JUNE-2012

## ME-803 COMPUTER AIDED MANUFACTURING

Time: 3 Hrs] [Total Marks: 70

Instructions:-

1. Attempt **all** Questions.
2. Figure to the **right** indicate full marks.
3. Answers to the two section must be written in **separate** drawing papers
4. Assume suitable data if **necessary**.
5. Draw neat sketch wherever essential.
6. Programming codes (G and M Codes) are given at the end of paper

### SECTION – I

**Q.1** (A) What is FMS? How to measure a flexibility of any manufacturing system? Explain with example. (4)

(B) Write appropriate steps for Automation of "Welding shop" (4)

(C) What is numerical control? Explain function objective and application of numerical control machine tool along with suitable example. (4)

**OR**

**Q.1** (A) Define CNC? What are the importances's of material use in structure of CNC machine tool? Explain the function of CNC machine tool (4)

(B) What is Adaptive control machining system? Explain types of adaptive control machining system with example. (4)

(C) Write a short note on "Guide ways and slide ways of CNC machine Tool" (4)

**Q.2** (A) What are the important of Feedback device in CNC machine tool? Explain rotary encoder. (4)

(B) What is a Storage buffer? Why storage buffer are used on automated production line? How they control of production line. (4)

(C) State the advantage of recalculating Ball screw compared to the Acme screws (4)

**OR**

**Q.2** (A) Enlist various advantages of automatic storage system. How it helps us to decrease lead time of manufacturing. (4)

(B) Differentiate following terms:

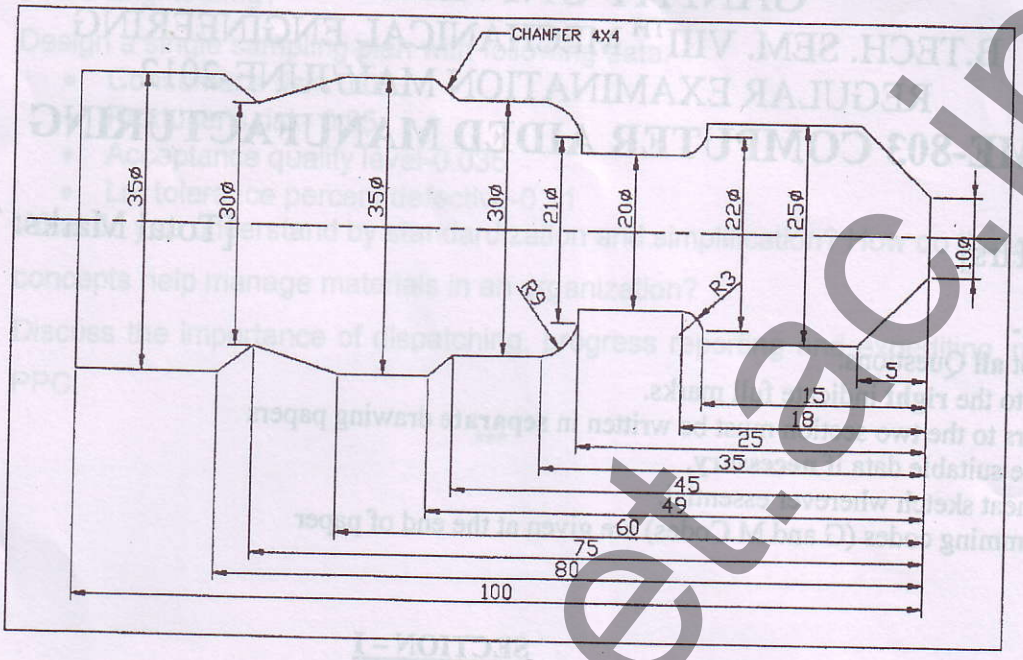
a. WCS and MCS
b. JOG Mode, MDA mode and
c. Swing Around MCU & In house MCU in NC Machine tool (4)

(C) What do you understand by the word Canned Cycle in manual part programming. Explain with net sketches the differences between the operations of the canned cycles G81, G84 & G86. (4)

**Q.3** **Write Following Answer**

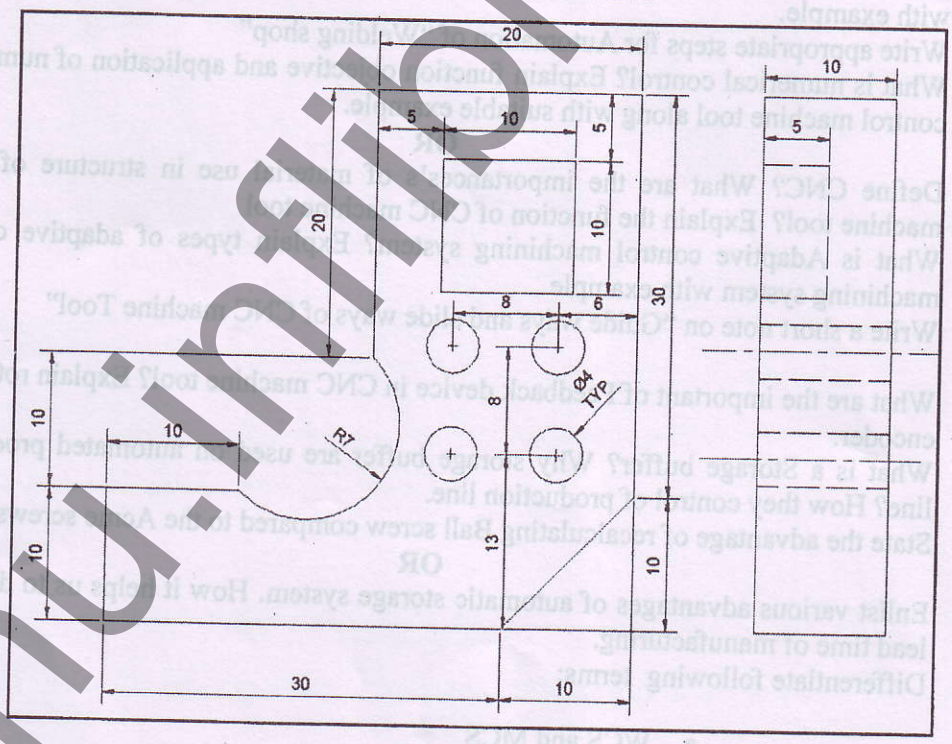
(A) Write a CNC Turning Center Program of given components. **(5)**

Raw Material size: 110 mm Long. X 40Φ




(B) Write a CNC Machining Center Program of given components. **(6)**

Raw Material size: 45 mm X 45 mm X 10 mm.



## SECTION – II

Q.4 (A) Explain Retrieval computer aided process planning system. (4)

(B) What is the composite part concept in Group technology? Explain it with example. (4)

(C) Explain MICLASS classification and coding system of group technology. (4)

**OR**

Q.4 (A) Explain Generative approach of CAPP system. (4)

(B) Explain DCLASS classification and coding system of group technology. (4)

(C) Write down types of robot drive system with example. (4)

Q.5 (A) Explain robot arm configuration with neat sketch. (6)

(B) Explain stereo- lithography process with neat sketch. (5)

**OR**

(A) Explain type of robot path control system with example. (6)

(B) Write down SGC process with neat sketch. (5)

Q.6 Write short notes on: (Any three) (12)

(A) What is a part family? What is the attribute use for part classification?

(B) Explain support structure mechanism in RP process.

(C) Discuss the difference between servo and non-servo robots.

(D) Explain 3D printing process with neat sketch.

**END OF PAPER**

**PREPARATORY FUNCTIONS (G CODES):**

G00 – Rapid transverse positioning
G01 – Linear interpolation (federate movement)
G02 – Circular interpolation clockwise
G03 – Circular interpolation counterclockwise
G04 – Dwell
G10 – Tool length offset value
G17 – Specifies X/Y plane
G18 – Specifies X/Z plane
G19 – Specifies Y/Z plane
G20 – Inch data input (on some systems)
G21 – Metric data input (on some systems)
G27 – Reference point return check
G28 – Return to reference point
G29 – Return from reference point
G30 –Return to second reference point
G40 – Cutter diameter compensation cancel
G41 – Cutter diameter compensation left
G42 – Cutter diameter compensation right
G43 – Tool length compensation positive direction
G44 – Tool length compensation negative direction
G45 – Tool offset increase
G46 – Tool offset decrease
G47 – Tool offset double increase
G48 – Tool offset double decrease
G49 – Tool length compensation cancel

G80- Canned cycle off
G81- Std. drilling cycle
G82- Dwell drilling cycle
G83 – Peak drilling cycle
G84 – Fine boring cycle
G85 – Boring cycle (feed return to reference level)
G86 – Boring cycle (rapid return to reference level)
G87 – Back boring cycle
G88 – Boring cycle (manual return)
G89 – Boring cycle (dwell before feed return)
G90 – Specifies absolute positioning
G91 – Specifies incremental positioning
G92 – Program absolute zero point
G98 – Return to initial level
G99 – Return to reference (R) level.

**MISCELLANEOUS (M) FUNCTIONS:**

M00 – Program stop
M01 – Optional stop
M02 – End of program (rewind tape)
M03 – Spindle start clockwise
M04 – Spindle start counterclockwise
M05 – Spindle stop
M06 – Tool change
M08 – Coolant on
M09 – Coolant off
M13 – Spindle on clockwise, coolant on (on some systems)
M14 – Spindle on counterclockwise, coolant on
M17 – Spindle and coolant off (on some systems)
M19 – Spindle orient and stop
M30 – End of program, memory reset
M98 – Jump to subroutine
M99 – Return from subroutine