Exam No: _____

GANPAT UNIVERSITY
B.TECH SEM VIII MECHANICAL
REGULAR EXAMINATION MAY-JUNE 2013
ME803 COMPUTER AIDED MANUFACTURING

TIME – 3 HOURS   **TOTAL MARKS- 70**

INSTRUCTION:-   1) All questions are compulsory.
                     2) Figures to the right indicate full marks.
                     3) Make suitable assumptions wherever necessary.
                     4) Programming code (G and M codes) is given at the end of paper.

SECTION-I

Que-1   **[12]**

(a) Explain subroutine and Macro with suitable examples.

(b) Explain with suitable examples how CAM is better than conventional manufacturing.

(c) What do you understand by machine zero and job zero? Explain the significance of using job zero method.

OR

Que-1   **[12]**

(a) Explain Do loop with suitable examples.

(b) Differentiate NC, CNC and DNC machines with their relative merits.

(c) Explain absolute and incremental positioning in NC machine tools with example.

Que-2   **[11]**

(a) What do you mean by FMS layout? Explain different types of FMS layouts with neat diagram.

(b) Write a manual part program of CNC turning center for the component shown in the fig.-1. Raw material size is ⌀100 × 103 mm.

OR

Que-2   **[11]**

(a) What is FMS? Discuss suitability of FMS and Problem faced in implementing FMS

(b) Write a manual part program for the component shown in the fig.-2. Raw Material Size: 100 X 100 X 25 mm.

Que-3   **Attempt Any three.**   **[12]**

(a) Explain AGVs with neat sketch

(b) What is material handling? Explain about equipments used for material handling.

(c) Enlist types of material handling system and explain all.

(d) What is tool length and cutter diameter compensation?

SECTION-II

Que-4 [12]

(a) What is group technology? Explain opitz classification and coding system in brief.

(b) Find out M/C cell and part family by using Rank Order Clustering technique.

M/C	PART							
	A	B	C	D	E	F	G	H
1			1	1	1			
2						1	1	
3						1		1
4			1	1				
5	1							
6						1	1	
7	1	1						
8			1	1				

OR

Que-4 [12]

(a) Explain KK3 classification and coding system with example.

(b) What is part family and composite part concept for group technology?

Que-5 [11]

(a) Describe slicing strategies of RP process.

(b) Describe FDM process with relative merits and demerits.

OR

Que-5 [11]

(a) Define RPT. Explain how RPT is useful in modern industrial context. What are its limitations?

(b) Explain SLS with relative merits and demerits.

Que-6 **Attempt Any three.** [12]

(a) Describe various sensors used in robot technology.

(b) Classify and explain any three robot configurations with neat sketches.

(c) Explain servo robot with net sketch.

(d) Differentiate between Generative process planning and Variant process planning.

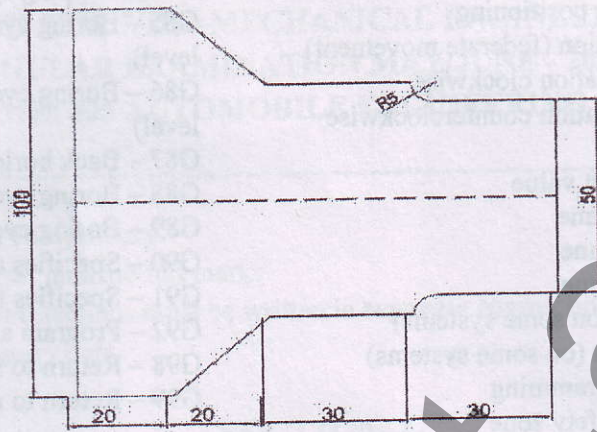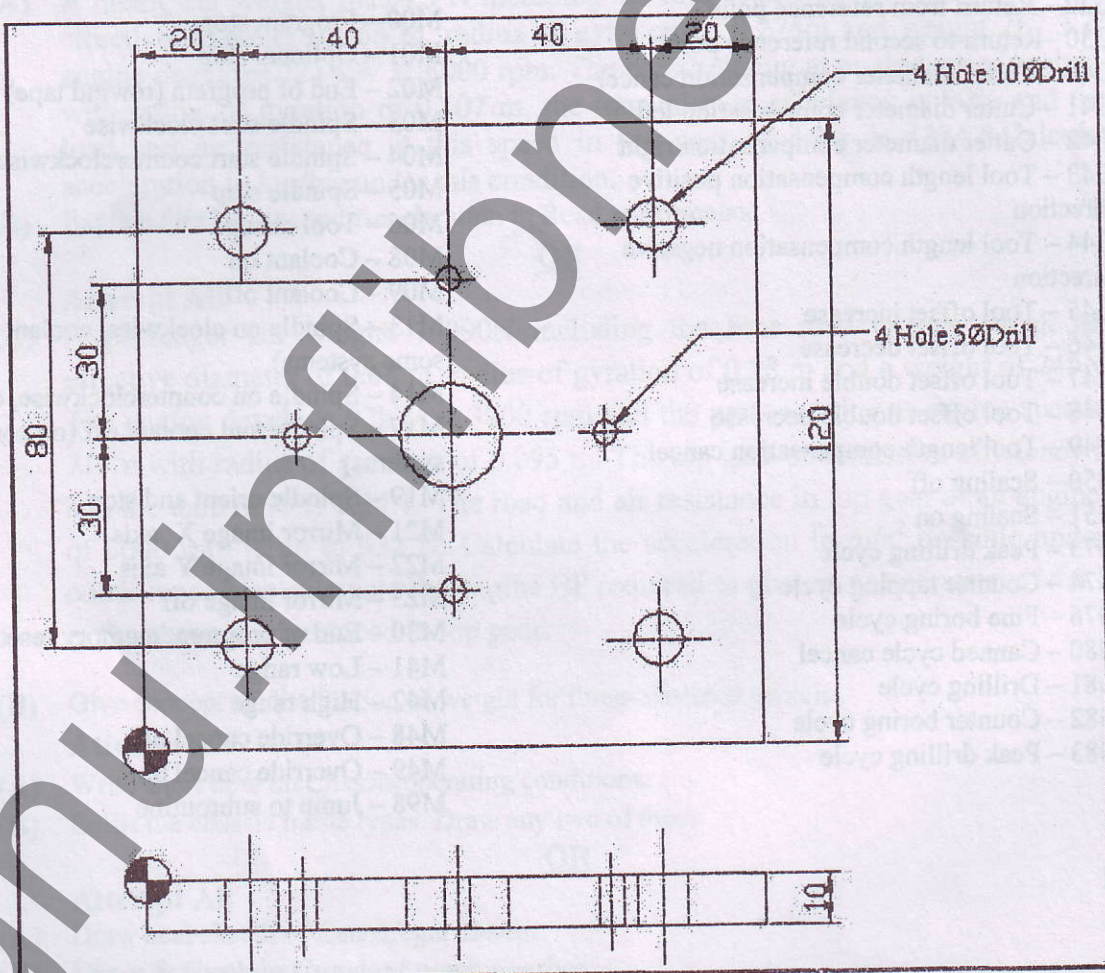**********END OF PAPER**********

Fig.-1

Fig.-2

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)
G22 – Salary zone programming
G23 – Cross through safety zone
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
G50 – Scaling off
G51 – Scaling on
G73 – Peak drilling cycle
G74 – Counter tapping cycle
G76 – Fine boring cycle
G80 – Canned cycle cancel
G81 – Drilling cycle
G82 – Counter boring cycle
G83 – Peak drilling cycle

G84 -- Tapping 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 (on some systems)
M17 – Spindle and coolant off (on some systems)
M19 – Spindle orient and stop
M21 – Mirror image X axis
M22 – Mirror image Y axis
M23 – Mirror image off
M30 – End of program, memory reset
M41 – Low range
M42 – High range
M48 – Override cancel off
M49 – Override cancel on
M98 – Jump to subroutine