Seat No:_____   Date:_____

GANPAT UNIVERSITY
B. Tech. Sem. VIII Mechatronics Engineering
Regular Examination May-June: 2012
MC 802 Computer Integrated Manufacturing

[Time: 3 Hour]   [Total Marks: 70]

Instructions:
1. Attempt all questions.
2. Assume suitable data if necessary.
3. Figures to the right indicate full marks

SECTION – I

Que. 1
(a) Schematically brief out co-relation of all importance elements of computer integrated manufacturing system.   06
(b) Briefly describe the features of an automatic tool change systems in turning centers used to establish flexible manufacturing system.   06

OR

Que. 1
(a) Brief out major area of applications of computer integrated manufacturing system with concrete example.   06
(b) With suitable example explain different approaches consider in order optimizing the overall efficiency and effectiveness of flexible manufacturing system.   06

Que. 2
(a) Define group technology along with different group layouts with examples.   04
(b) Apply rank order clustering technique to the part machine incidence matrix as shown in table.   04

MACHINES	A	B	C	D	E	F	G	H	I
1	1	0	0	1	0	0	0	1	0
2	0	0	0	0	1	0	0	0	1
3	0	0	1	0	1	0	0	0	1
4	0	1	0	0	0	0	0	0	0
5	1	0	0	0	0	0	0	1	0
6	0	0	1	0	0	0	0	0	1
7	0	1	0	0	0	1	1	0	0

(c) How parts classification and coding systems can be grouped focusing on attributes?   03

OR

Que. 2
(a) Explain with example basic code structures used in parts classification and coding system for group technology applications.   06
(b) List out different systems use to assign the codes and briefly elaborate all the features of OPITZ system with suitable example.   05

Que. 3 Attempt any Three.
                                                                                                     12
(a) Elaborate comparison of flexible manufacturing system with other manufacturing approaches.
(b) Schematically elaborate the computer integrated manufacturing wheel concept.
(c) Explain the benefits of group technology with their area of applications.
(d) Brief out the implementation sequence of computer integrated manufacturing with list of benefits computer integrated manufacturing.

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SECTION – II

Que. 4

(a) What are the various process involved in set up planning in the case of rotational part? — 04

(b) Why do you need NC motion control system? Explain straight line motion control system and its use. — 04

(c) What is Adaptive control machining system? Explain types of adaptive control machining system with example. — 04

Que. 4   **OR**

(a) Briefly Explain the methodology to be followed for developing a retrieval type CAPP system. — 04

(b) How Computer Aided process Planning is useful in current environment of industries? — 04

(c) State the advantage of recalculating Ball screw compared to the Acme screws. — 04

Que. 5

(a) How is cutter compensation given in the case of machining center? Explain with the help of an example how is operational — 04

(b) 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. — 04

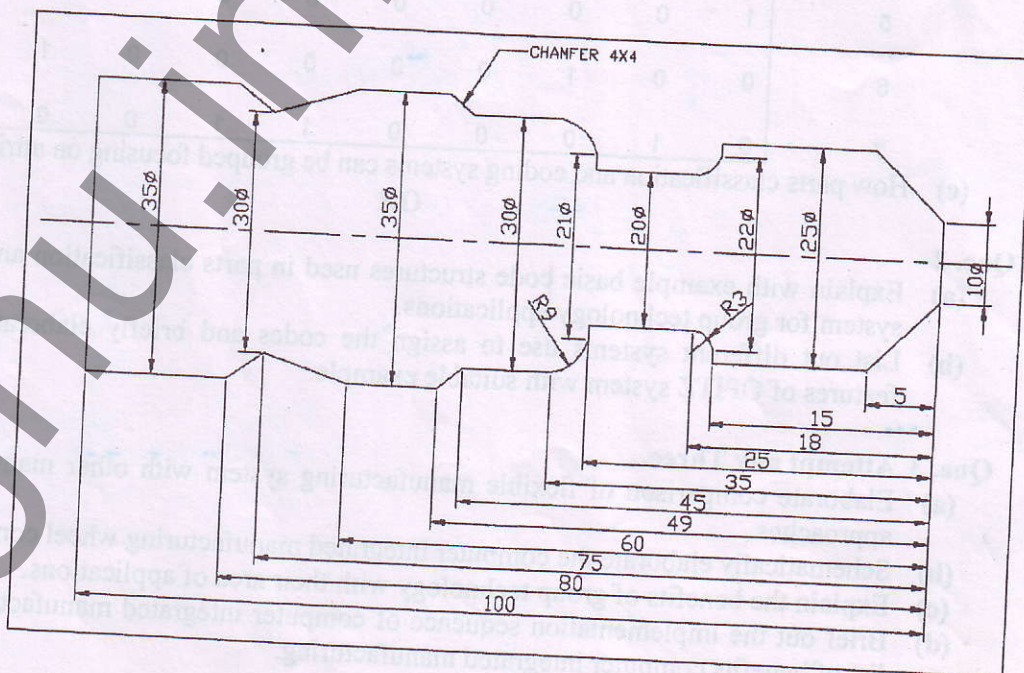(c) Explain LAN concept its importance and different protocol and types — 03

Que. 5   **OR**

(a) Modulation and demodulation in communication.

(b) Explain ATC in CNC Machine tool. — 04

(c) What is Hexapod? Why Hexapod required? Explain the application of Hexapod — 04 / 03

Que. 6

(A) Write a CNC Turning Center Program of given components.
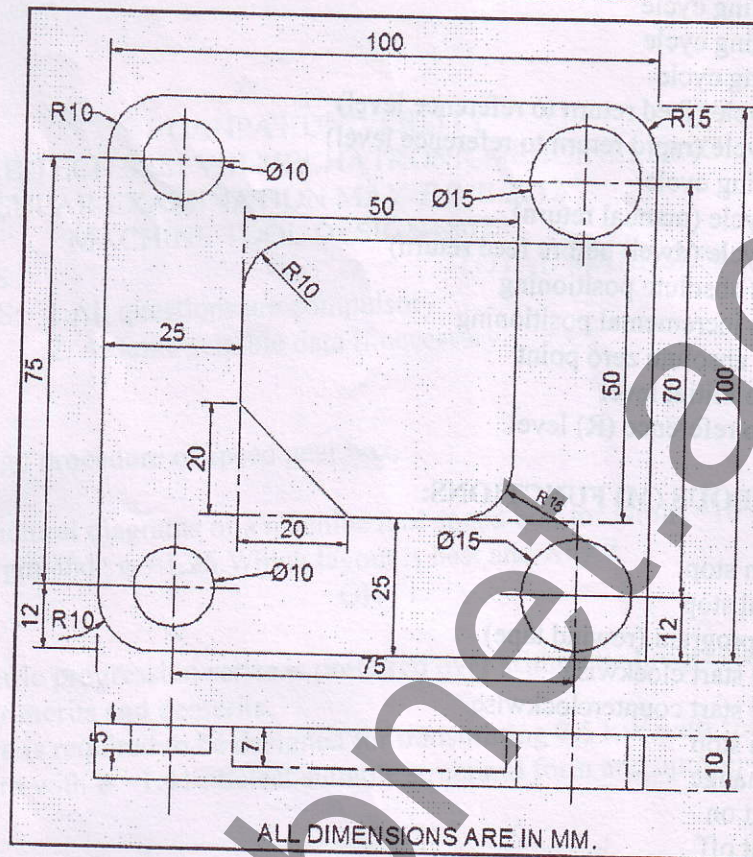Raw Material size: 110 mm Long. X 40Φ — 06

CHANFER 4X4

(B) Write a CNC Machining Center Program of given components.
Raw Material size: 110 mm X 110 mm X 10 mm.

ALL DIMENSIONS ARE IN MM.

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

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