Student Exam. No._____

GANPAT UNIVERSITY

M.TECH. SEM. II[nd] (AMT) MECHANICAL ENGINEERING

REGULAR EXAMINATION JUNE/JULY-2012

3ME201 COMPUTER INTEGRATED 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 – II

Q.1 (A) What is DNC? Briefly discuss types of DNC System. (4)

(B) What are the requirements of feed back device in CNC machine tools? Explain Encoder used in CNC machine tool. (4)

(C) Explain ATC in CNC Machine tool. (4)

OR

Q.1 (A) Describe the functionality of workstation and satellite computer in CAD/CAM integration (4)

(B) Discuss how sliding friction is converted into rolling friction in CNC machines with neat sketch. (4)

(C) What are the different between MCS and WCS? (4)

Q.2 (A) Modulation and demodulation in communication. (4)

(B) Explain LAN concept its importance and different protocol and types (4)

(C) How is cutter compensation given in the case of machining center? Explain with the help of an example how is operational. (4)

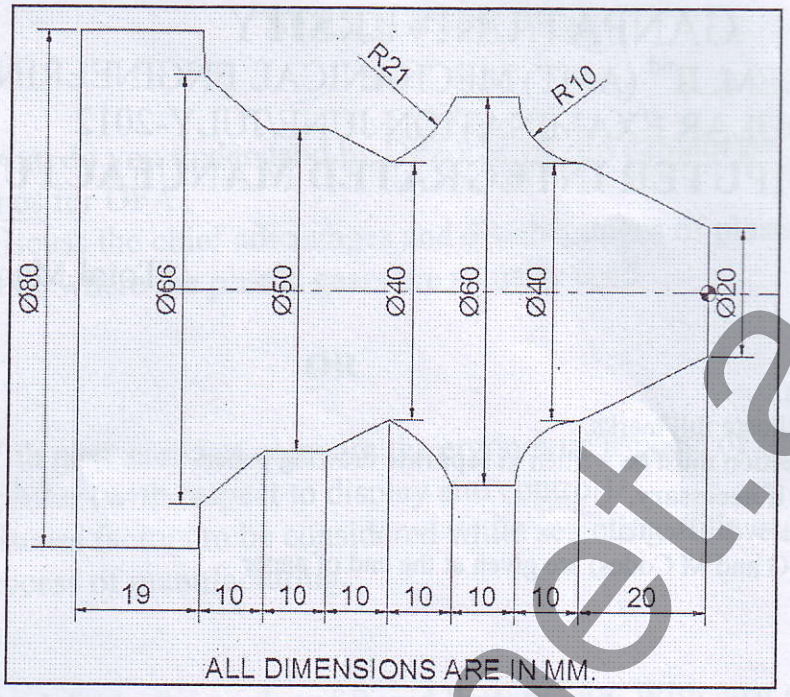
OR

Q.2 (A) What factor should be kept in mind during the design of spindles for CNC machine tools? (4)

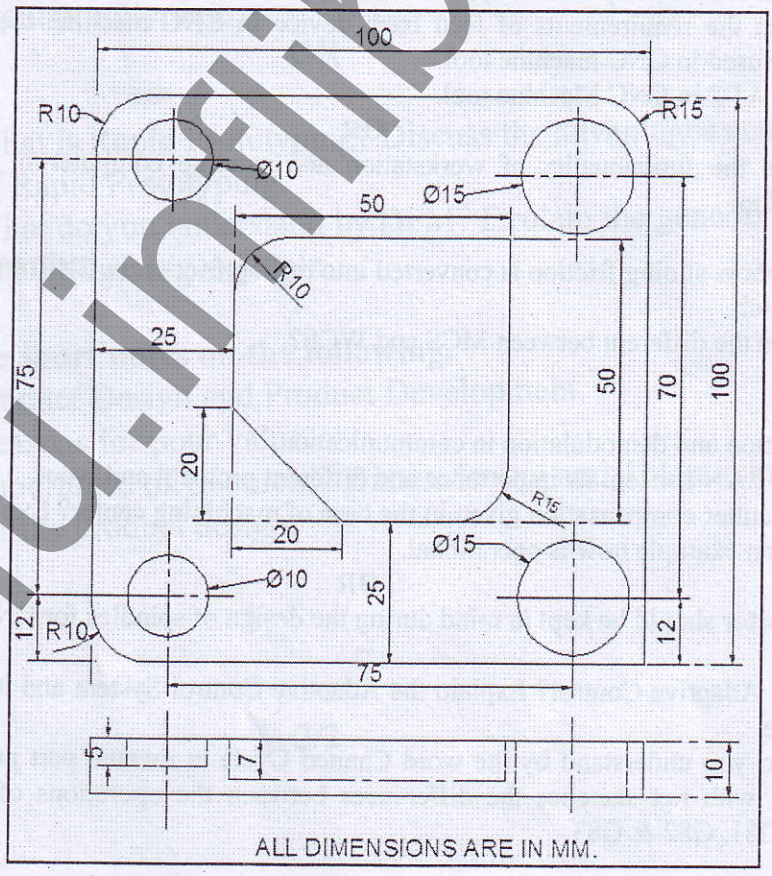
(B) What is Adaptive Control? Explain the Adaptive Control System and its types with example (4)

(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, G82 & G83. (4)

Q.3 (A) Write a program of CNC Turning Center for following component shown in fig.: Raw Material Size: 90Φ X 105 mm. (6)

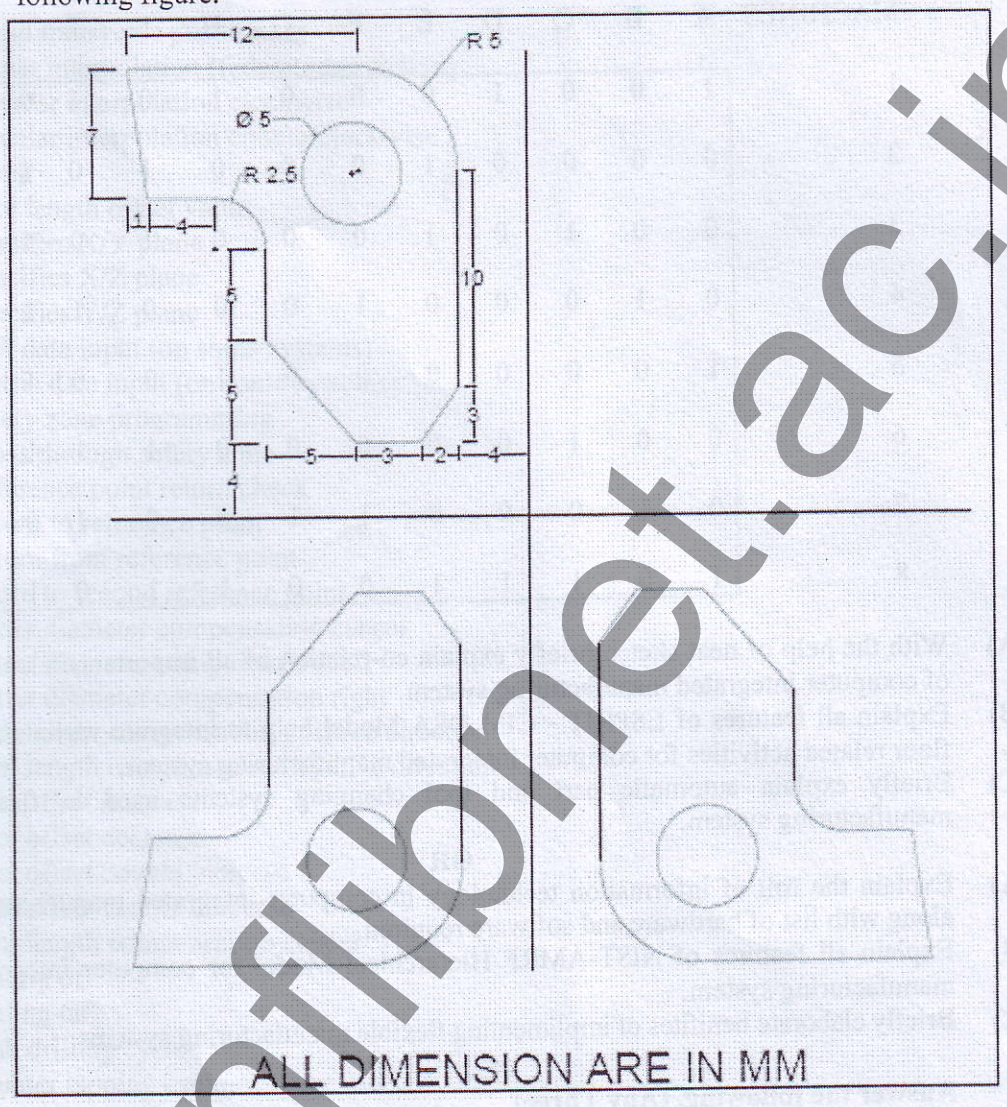


(B) Write a CNC Drilling part program for a following Component. (5)
Raw material size: 110 X 110 X 10 mm.



OR

(B) Write the CNC Part programme using mirror and unconditional jump command for following figure. (5)



SECTION – II

Q.4 (A) Determine flexible manufacturing system with minimum two definitions of it also elaborate clear objectives and area of applications of FMS implementation. (6)

(B) Define group technology along with different group layouts and their advantages with examples. (6)

OR

Q.4 (A) With suitable example explain different approaches consider in order optimizing the overall efficiency and effectiveness of flexible manufacturing system. (6)

(B) Apply rank order clustering technique to the part machine incidence matrix as shown in table. (6)

MACHINES	A	B	C	D	E	F	G	H	I	J	K
1	1	0	0	1	0	0	0	1	0	1	0
2	0	0	0	0	1	0	0	0	1	0	1
3	0	0	1	0	1	0	0	0	1	0	1
4	0	1	0	0	0	1	0	0	0	1	1
5	1	0	0	0	0	0	0	1	0	0	1
6	0	0	1	0	0	0	0	0	1	1	1
7	0	1	0	0	0	1	1	0	0	1	0
8	1	0	1	1	1	0	0	1	1	0	1

Q.5 (A) With the help of neat sketch briefly explain co-relation of all importance elements of computer integrated manufacturing system. (4)

(B) Explain all features of ESPRIT - CIM OSA Model help to integrate various shop floor related activities for computer integrated manufacturing system. (4)

(C) Briefly explain automatic part and tool changing systems used in flexible manufacturing system. (3)

OR

Q.5 (A) Explain the roll of information technology in computer integrated manufacturing along with list of hardware and software required. (4)

(B) Explain all features of NIST-AMRF Hierarchical Model for computer integrated manufacturing system. (4)

(C) Briefly elaborate benifites of implimenting flexible manufacturing systems. (3)

Q.6 **Answer the following. (Any Three)** 12

i. Schematically elaborate the computer integrated manufacturing wheel concept.

ii. Brief out the guideline for development of computer integrated manufacturing.

iii. Briefly elaborate all the features of the CODE system use for group technology.

iv. How parts classification and coding systems can be grouped focusing on attributes?

Best of Luck

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
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
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
M99 – Return from subroutine