Student Exam. No._____

GANPAT UNIVERSITY

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

CBCS REGULAR EXAMINATION April - June 2015 EXAMINATION

2ME-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

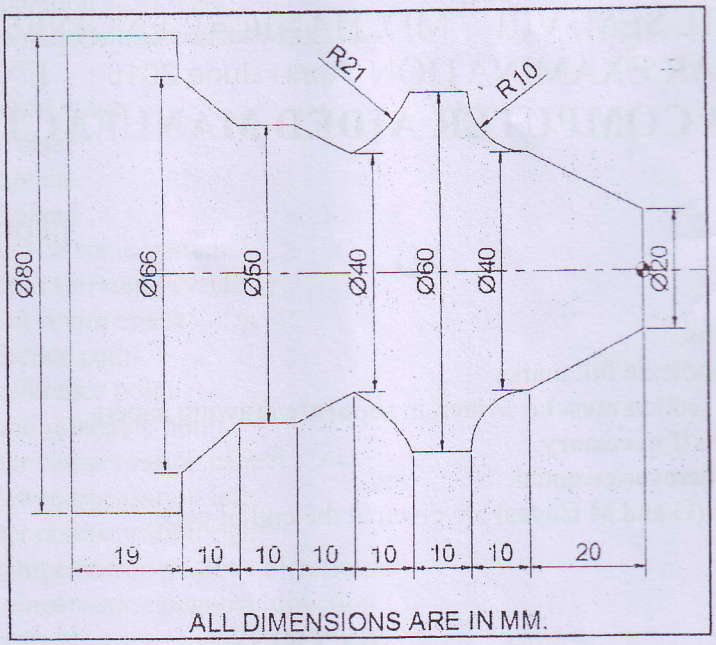
SECTION – I

Q.1	(A)	Write appropriate steps for automation of foundry shop using USA automation strategies.	(4)
	(B)	What factor should be kept in mind during the design of spindles for CNC machine tools?	(4)
	(C)	Discuss how sliding friction is converted into rolling friction in CNC machines with neat sketch	(4)
		OR	
Q.1	(A)	Why do you need NC motion control system? Explain straight line motion control system and its use.	(4)
	(B)	What is Adaptive control machining system? Explain types of adaptive control machining system with example.	(4)
	(C)	Briefly describe about types of electrical drives used in CNC machine tools.	(4)
Q.2	(A)	What are the important of Feedback device in CNC machine tool? Explain rotary encoder.	(4)
	(B)	Give a comparison of the encoder and linear scale as a feedback device for displacement in CNC machine tools.	(4)
	(C)	Explain ATC in CNC Machine tool.	(4)
		OR	
Q.2	(A)	What are the applications where Numerical Control is most suitable?	(4)
	(B)	How is cutter compensation given in the case of machining center? Explain with the help of an example how is operational	(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**

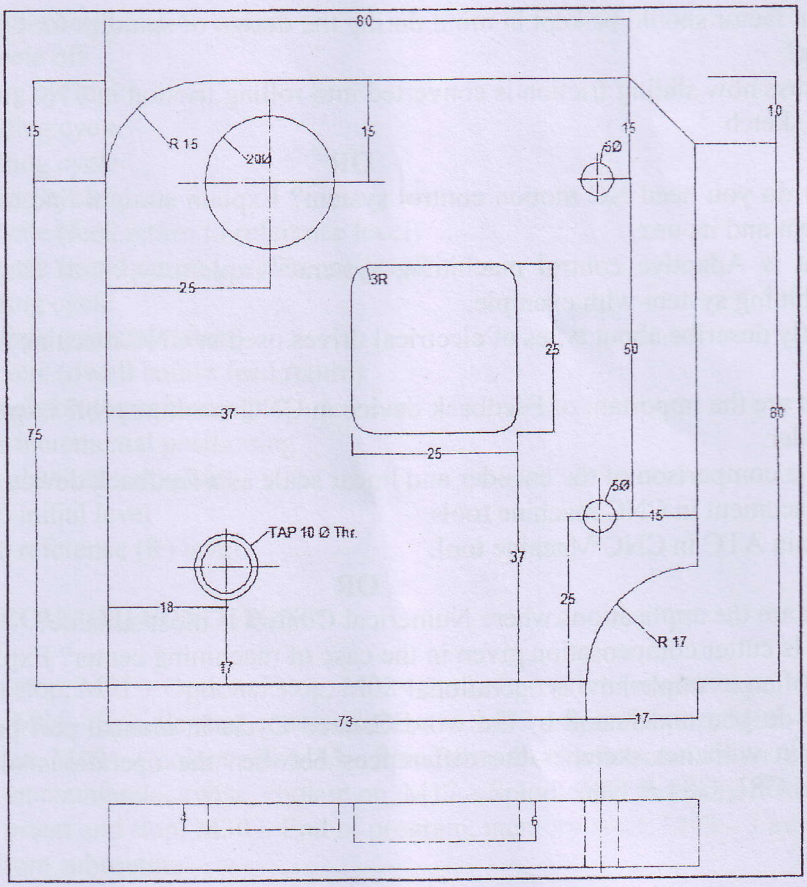
(A) Write a CNC Turning Center Program of given components. (5)

Raw Material size: 100 mm Long. X 82Φ



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

Raw Material size: 100 mm X 100 mm X 10 mm.



SECTION – II

Q.4 (A) What is GT? Why group technology more important in the present manufacturing scenario? (4)

(B) Give brief description about the retrieval type CAPP method. (4)

(C) Explain the structure used in classification & Coding system: (4)

OR

Q.4 (A) Explain the 10 principles of material handling. (4)

(B) Define Robot? Explain physical configuration of robots. (4)

(C) Enlist basic parts of robot & explain functionality of each part. (4)

Q.5 (A) What is PFA? Apply the rank order clustering technique to the part-machine incidence matrix in the following table to identify logical part family and machine groups. Parts are identified by letter and machines are identified numerical. (6)

Component	Operations							
	1	2	3	4	5	6	7	8
A	X	X		X	X		X	
B	X	X	X	X	X	X	X	X
C			X	X	X			X
D								
E								
F								
G								
H			X					
I	X	X	X	X	X	X	X	X

(B) Explain degree of freedom for robot with net sketch. (5)

OR

Q-5 (A) Enlist software use for CAM and describe the general functionality of them. (6)

(B) Enlist and describe the elements for data transfer from workstation to machine tools. (5)

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

(A) Explain Opitz classification and coding method

(B) Briefly explain the basis of designating the co-ordinate axes in CNC machine tools.

(C) Briefly explain the need of CAPP in industries.

(D) What is AGV? Explain AGV systems.

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