

**GANPAT UNIVERSITY**  
**B.TECH. SEM. VIII<sup>TH</sup> MECHANICAL ENGINEERING**  
**CBCS REGULAR EXAMINATION MAY/JUNE-2017 EXAMINATION**  
**2ME803 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 the importance's of work holding device in CNC machine tool? Explain work holding devices. (4)
- (B) What are the requirements of the Structure in CNC machine tools? (4)
- (C) Briefly describe about types of electrical drives used in CNC machine tools. (4)

**OR**

- Q.1** (A) What is Adaptive control machining system? Explain types of adaptive control machining system. (4)
- (B) State the advantages of recalculating ball screws compared to the conventional Acme screws. (4)
- (C) Enlist the feedback device. Explain any one linear and rotary feedback device. (4)

- Q.2** (A) Explain the general criteria for testing the performance of CNC machine tool. (4)
- (B) What are the different between MCS and WCS? (3)
- (C) Enlist software use for CAM and Explain the types of integration used for CAD and CAM integration. (4)

**OR**

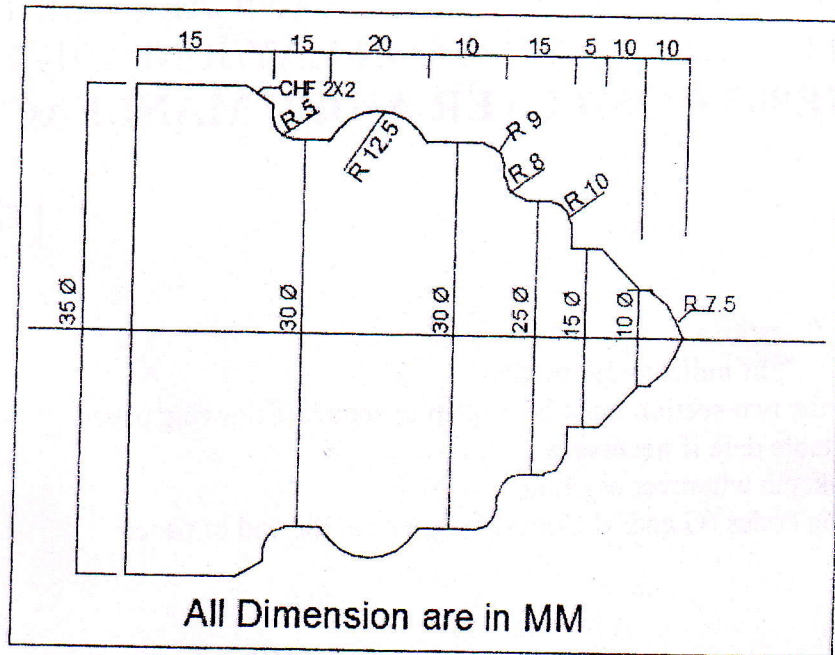
- Q.2** (A) Explain ATC in CNC Machine tool. (4)
- (B) Define CNC? Explain the objective and function of CNC machine tool. (3)
- (C) Explain the different between BTR system of DNC and Special Machine controlled unit system of DNC. (4)

Q.3

Write Following Answer,

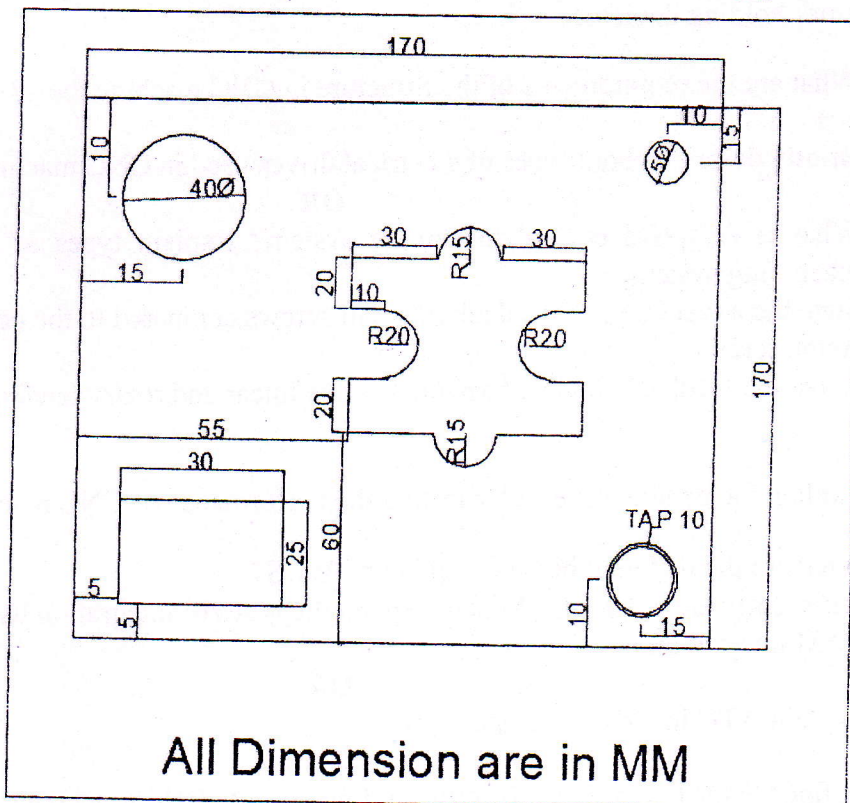
- (A) Write a CNC Turning Center Program of given components.  
Raw Material size: 105 mm Long. X 36 $\Phi$

(5)



- (B) Write a CNC Machining Center Program of given components.  
Raw Material size: 170 mm X 170 mm X 10 mm thick.

(7)



Depth for all operations are 10 mm.(Throughout cut)



## SECTION – II

- Q.4 (A) What is a Flexible Manufacturing system? What renders it so flexible? (4)
- (B) Write appropriate steps for automation of foundry shop using USA automation strategies. (4)
- (C) Explain the Pocket identification in generative type CAPP system. (4)

**OR**

- Q.4 (A) Write merits of Computer Aided Manufacturing and how it helps to world-class manufacturing and manufacturing Excellence. (4)
- (B) Enlist the FMS components. And Explain the FMS layout configurations in detail. (4)
- (C) Explain the structure used in classification & Coding system: (4)

- Q.5 (A) What is Group Technology? What are the favorable conditions for Applying GT? Explain the benefits of Group Technology with their area of application. (4)
- (B) Define Robot? Explain physical configuration of robots. (3)
- (C) What is a part family? What is the attribute use for part classification? (4)

**OR**

- Q.5 (A) What is AS/RS system? Explain types of AS/RS and its applications. (6)
- (B) 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. (5)

Parts		A	B	C	D	E	F	G
Machine	1	1					1	
	2		1			1		1
	3	1			1		1	
	4		1	1				
	5				1			1
	6	1					1	

- Q.6 Write short notes on: (Any three) (12)
- (A) Enlist basic parts of robot & explain functionality of each part.
- (B) Explain Optiz coding system with example.
- (C) What is AGV? Explain AGV systems.
- (D) Explain the 10 principles of material handling.

END OF PAPER

## PREPARATORY FUNCTIONS (G CODES):

G00 – Rapid transverse positioning  
G01 – Linear interpolation (feedrate 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