

GANPAT UNIVERSITY
B.TECH. SEM. VIIITH MECHANICAL ENGINEERING
CBCS REGULAR EXAMINATION April - June 2016
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) Give a comparison of the encoder and linear scale as a feedback device for displacement in CNC machine tools. (4)
- (B) What factor should be kept in mind during the design of spindles for CNC machine tools? (4)
- (C) What are the different between MCS and WCS? (4)

OR

- Q.1** (A) Show schematically the different forms of Numerical Control, Viz. open loop and closed loop control systems (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)
- Q.2** (A) What is Adaptive control machining system? Explain types of adaptive control machining system. (4)
- (B) What is a Flexible Manufacturing system? What renders it so flexible? (4)
- (C) 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. (4)

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

OR

- Q.2 (A) Define CNC? Explain the function of CNC machine tool
 (B) Discuss the various FMS layout configurations.
 (C) Explain Optiz coding system with example.

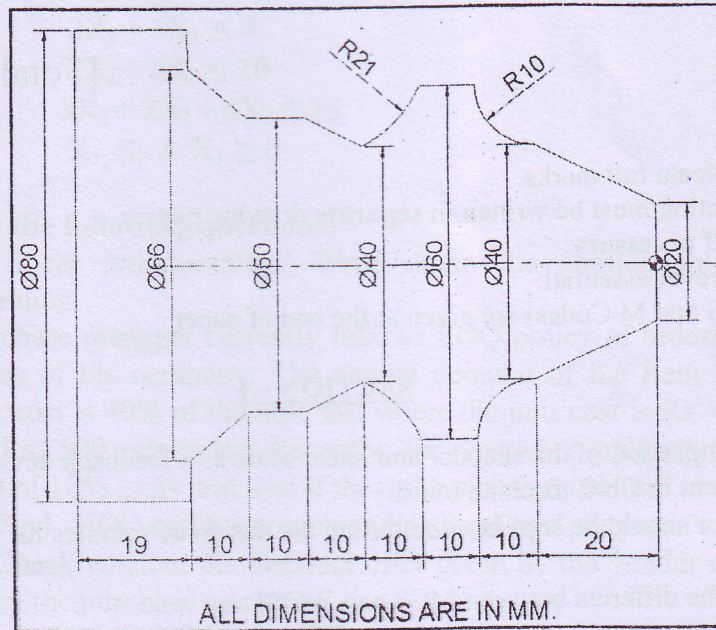
(4)

Q.3 Write Following Answer

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

(5)

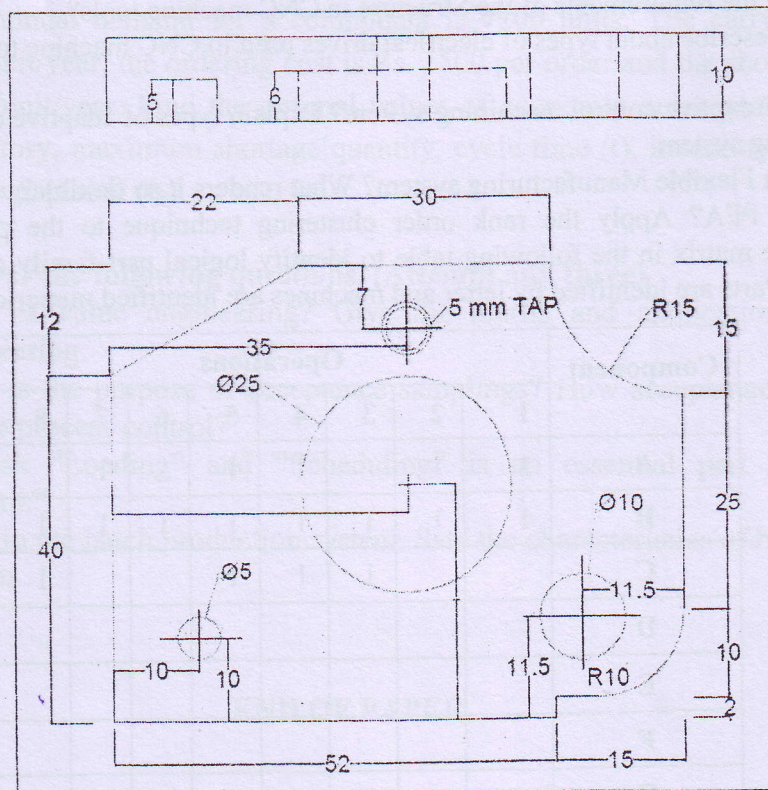
Raw Material size: 100 mm Long. X 82Φ



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

(6)

Raw Material size: 60 mm X 75 mm X 10 mm.



SECTION - II

- Q.4 (A) Define following terms of AGV 1) Guide path 2) Routing 3) Scheduling 4) (4)
Idle vehicle 5) Deadlock.
- (B) What is automatic storage system? Why it required? Compare AS/RS with (4)
Carousel storage system.
- (C) What is Laminated Object Manufacture (LOM) in Rapid Prototype? Give in (4)
detail.

OR

- Q.4 (A) Different guidance techniques for AGV. Give detail of how SGV work. (4)
(B) What is AS/RS system? Explain types of AS/RS and its applications. (4)
(C) What is Rapid Prototype? Explain Steps of Rapid Prototype. (4)

- Q.5 (A) What is a Storage buffer? Why storage buffer are used on automated production (6)
line? How they control of production line.
- (B) Differentiate robotic configuration with their advantages and disadvantages. (5)

OR

- (A) What are the various approaches available for CAPP? Explain in brief Retrieval (6)
type CAPP
- (B) What is material handling? Explain about equipment's used for material (5)
handling.

- Q.6 Write short notes on: (Any three) (12)
- (A) Explain degree of freedom for robot with net sketch.
- (B) Explain the pocket identification in generative type CAPP system.
- (C) Enlist basic parts of robot & explain functionality of each part.
- (D) Explain Vehicle Guidance Technology.

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)
G22 – Safety 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
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