Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.Tech (IEM)/SEM-1/IEM-105C/2010-11

2010-11

COMPUTER INTEGRATED MANUFACTURING

Time Allotted : 3 Hours *Full Marks :* 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any *five* questions. 5 × 14 = 70

1. a) Discuss the benefits of CAD/CAM to engineering design as compared to conventional methods. 4

   b) What is product lifecycle ? Describe a typical product lifecycle with help of neat sketch. 6

   c) Write down DDA algorithm for line drawing in computer (for slop < 1). 4

2. a) What are different classes of manufacturing ? Give examples of each. 4

   b) Define lead time. Explain how it changes with the concurrent engineering practice. 4

c) Describe elaborately the various components present in the information system for production planning of an industrial organization. 6

3. a) What is Group Technology ? State the importance of 'Group Technology' in an integrated automation system. 6

b) State the characteristic features of MICLASS parts codification system. Mention few design and manufacturing attributes in the context of GT. 8

4. a) What is CAPP ? Differentiate between retrieval and generative type CAPP. Illustrate your answer. 6

b) What is FMS ? How does it differ from a Transfer Line System ? Name various types of Transfer Lines. 6

c) Name different types of FMS layouts. 2

5. a) What is AGV ? State with neat sketch different types of AGVS that are used in automated manufacturing. 6

b) Illustrate different types of guidance methods available for AGVS. 6

c) What is AS and RS ? 2

6. a) Define Robots. State different components of a typical robot system. 6

b) What is 'work envelope' ? Describe with neat sketch different types of work envelope in robot system. 6

c) State with neat sketch the different motions of a robot arm. 2

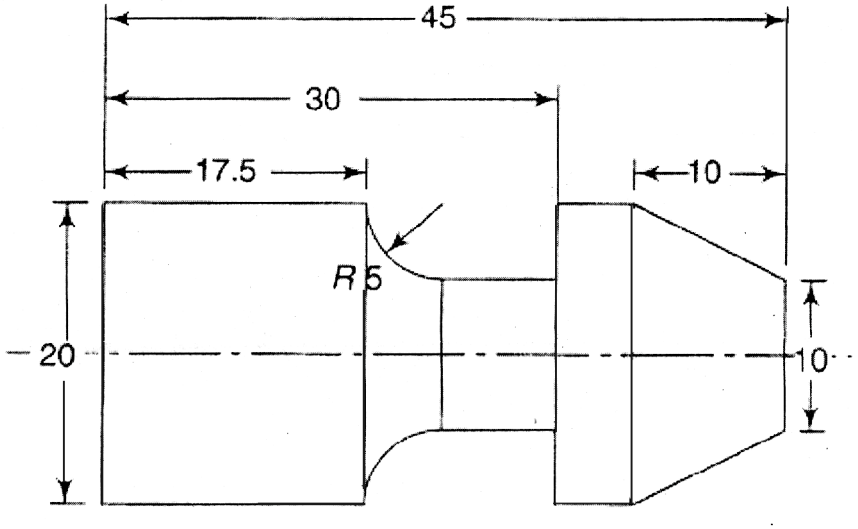
7. a) Explain the applications for which robots are generally used. 4

b) What is Robot Vision ? Briefly describe different steps of a Robot Vision system. 4

c) Write a VAL II program for a robot to palletize a rectangular part that is 250 mm × 150 mm. It has to arrange the part in 3 uniform rows of 4 parts each. The pallet size is 1 m × 0·65 m. The minimum clearance between the parts and edges should be at least 50 mm. 6

8. a) Write short notes on *G*-code and *M*-code. 6

b) The following components is to be made using a CNC turning centre equipped with Fanuc controller. Write down the part programming for finishing operation of the following part. 8



(All Dimensions are in mm)