

Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/M.TECH (IEM)/SEM-1/IEM-105C/2011-12  
2011**

**COMPUTER INTEGRATED MANUFACTURING**

Time Allotted : 3 Hours

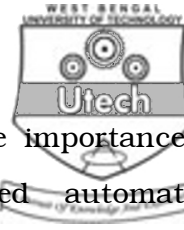
Full Marks : 70

*The figures in the margin indicate full marks.*

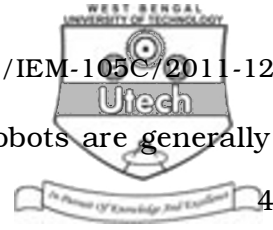
*Candidates are required to give their answers in their own words  
as far as practicable.*

Answer any *five* questions.

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  
          life cycle with help of neat sketch. 6  
      c)   Write down DDA algorithm for line drawing in computer  
          ( for  $\text{slop} < 1$  ). 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  $250 \text{ mm} \times 150 \text{ mm}$  it has to arrange the part in 3 uniform rows of 4 parts each. The pallet size is  $1 \text{ m} \times 0.65 \text{ m}$ . The minimum clearance between the parts and edges should be at least 50 mm. 6
8. a) What are the different types of automation ? Illustrate with example. 6
- b) Classify NC machines with explanation. Write notes on adaptive control. 8
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