CAD/CAM (Common to Automobile Engineering and Mechanical Engineering)

Time: 3 hours
Max. Marks: 70

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B

PART–A (22 Marks)

1. a) List the advantages of computer aided design and Manufacturing. [4]
   b) How does a CRT work? [3]
   c) Describe various G and M codes used in CNC machines? [4]
   d) Discuss the advantages of Group Technology? [3]
   e) Define the terms precision and accuracy? [4]
   f) Explain about capacitive planning. [4]

PART–B (3x16 = 48 Marks)

2. a) Elaborate on the basic requirements that CAD software has to satisfy. [8]
   b) What are the functions of an interactive graphic design workstation? [8]

3. a) Explain the salient features of any two CAD/CAM software that are being currently used in the industry. What are factors may influence for the selection of particular software? [8]
   b) What are the different types of contouring system in a CNC machine? Explain with neat sketches. [8]

4. a) What is the importance of G-codes in part programming? Give examples. [8]
   b) Describe the types of electrical drives used for speed and feed control in CNC machine tools. [8]

5. a) What is meant by a part family in Group Technology? Name and explain three parts classification and coding systems commonly used in GT. [8]
   b) What is computer aided process planning? Discuss variant process planning in detail with an example? [8]

6. a) Explain about the integration of CAQC with CAD/CAM. [8]
   b) Explain one non-contact and one non-optical inspection method with sketch. [8]

7. a) Explain different functions of CIM? [8]
   b) What is a material requirement planning? Explain the various inputs to the MRP system? [8]

1 of 1
IV B. Tech I Semester Regular/Supplementary Examinations, October/November - 2017
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Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B

PART–A (22 Marks)

1. a) Distinguish between 2-D and 3-D wire frame models [4]
b) Explain Boundary representation modeling. [3]
c) Explain the details of polygon clipping. [4]
d) Explain with neat sketch about Retrieval CAPP system. [3]
e) Describe any two computer aided testing methods with neat sketch. [4]
f) CAD helps in integrating CAM- Justify this statement. [4]

PART–B (3x16 = 48 Marks)

2. a) What do you understand by Geometric transformation? Explain any three common transformations used in computer graphics. [8]
b) Bring out clearly the difficulties a design engineer has to face at each of the design stages if they are carried out manually. [8]

3. a) Find the degree of Bezier curve controlled by three points (4, 2), (0, 0) and (2, 8). Also find the equation of the Bezier curve in parametric format with parameter “µ”? [8]
b) List six NC words used in part programming. [8]

4. a) Distinguish between point-to-point control and continuous path control in NC system. [8]
b) What is meant by the DNC? Discuss how it is different from CNC. [8]

5. a) What is group technology? Discuss machine cell design in G.T.? [8]
b) Explain with your own case study about the production planning process in discrete part manufacturing. [8]

6. a) Explain the working principle of computer vision system with a neat sketch. [8]
b) Explain one non-contact and one non optical inspection method with sketch. [8]

7. a) Discuss the importance of Master production scheduling in the Automated shop floor. [8]
b) Define CAD/CAM and CIM. Give a brief description of their application in industries? [8]
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Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B

PART–A (22 Marks)
1. a) Discuss different types of Graphical coordinate system. [4]
b) How do you specify a plotter for graphics application? [3]
c) With sketch, explain ATC. [3]
e) How SQC helps in qualitative decision makings in the manufacturing industry? [4]
f) Explain CIM wheel with neat sketch. [4]

PART–B (3x16 = 48 Marks)
2. a) What are the functions of an interactive graphic design workstation? [8]
b) Explain how CAD helps to synthesize a product design and do engineering analysis for getting optimal design. [8]

3. a) What is meant by a Geometric Entity? Explain the common entities used in Geometric Modelling. [8]
b) With neat sketches, explain open loop and closed loop control in NC system. [8]

4. a) Explain various types of input devices used in modern CNC controller for loading programs. [8]
b) With a block diagram, explain the various sub-systems and functions of a modern CNC controller. [8]

5. a) Differentiate between retrieval type and generative type CAPP systems? List out the merits and demerits of each type. [8]
b) Classify the methods of grouping parts into families. Explain any two systems in detail. [8]

6. a) Explain the need for automated inspection strategies in a manufacturing plant. [8]
b) Compare and contrast, contact and non-contact inspection techniques. [8]

7. a) Explain in detail the integration of CAD, CAM, CAE and CAPP systems in CIM Environment. [8]
b) Describe the following conveyors used in material transport systems:
   (i) In-floor tow-line conveyor [8]
   (ii) Overhead trolley conveyor [8]
PART – A (22 Marks)

1. a) Differentiate between classical design and computer aided design process. [4]
   b) Explain Constructive solid modeling. [3]
   c) What is a machining center? How it differs from conventional CNC milling machine? [4]
   d) Explain about Generative CAPP system. [3]
   e) How SQC helps in qualitative decision makings in the manufacturing industry? [4]
   f) Discuss the importance of Resource requirement planning. [4]

PART – B (3x16 = 48 Marks)

2. a) How CAD/CAM systems are evaluated? Explain in detail by categorizing evaluation parameters during selection. [8]
   b) What are the different types of contouring system in a CNC machine? Explain with neat sketches. [8]

3. a) Explain the coons and Bezier surfaces. What are the differences and applications for which these are used? [8]
   b) Write ATP geometry and motion statements for the work part shown

   ![Diagram]

   All dimensions are in cm [8]

4. a) What is a machining center? How it differs from conventional CNC milling machine? [8]
   b) What is right hand rule in NC where it is used? [8]

5. a) Explain the Optiz coding system generally used in group technology. [8]
   b) Explain about the production flow analysis. [8]
6. a) Write briefly on contact inspection methods?  
    b) Explain the need for automated inspection strategies in manufacturing plant.

7. a) Write the Principles of Material handling systems. 
    b) In what ways CAD, CAM, CAE and CAPP can help manufacturing activity? 
       Discuss.