

[M16CAD1101]
I/II M.Tech. (CAD/CAM) I Semester Regular Examinations
MODEL QUESTION PAPER
COMPUTER GRAPHICS

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

1. (a) Explain the Bresenham's algorithm for generating a circle and discuss about its advantages. 7 M
(b) Explain about the graphic primitives for display-file structure. 7 M
2. (a) Explain an algorithm for filling a polygon with a pattern. 8 M
(b) Develop a combined transformation matrix to reflect the given object about a line passing through the point (x_p, y_p) and having a slope l_m . 6 M
3. (a) Explain the procedure for creating and closing a segment. 7 M
(b) Explain about the generalized clipping. 7 M
4. (a) Derive the combined transformation matrix to rotate the given 3-D object about an axis passing through the points (x_a, y_a, z_a) and (x_b, y_b, z_b) . 7 M
(b) Explain transformation for perspective projection. 7 M
5. (a) Explain the Painter's algorithm with a suitable example. 7 M
(b) Explain about any one shading algorithm. 7 M
6. (a) Write the algorithm to generate the Bezier curve for the four given points. 7 M
(b) What is fractal? How they are useful in generating lines and surfaces? 7 M
7. (a) Write short note on 3-D homogeneous transformations. 7 M
(b) Explain the procedure to represent a surface patch in a CAD model. 7 M
8. Write a short note on the following
(a) Pixels and frame buffers 4 M
(b) Inside test 3 M
(c) Scaling transformation 3 M
(d) Curve fitting and curve fairing technique 4 M

[M16CAD1101]

[M16CAD1102]

I/II M.Tech. (CAD/CAM) I Semester Regular Examinations
MODEL QUESTION PAPER

INTEGRATED COMPUTER AIDED DESIGN COMPUTER GRAPHICS

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

1. (a) What is CAD and what are its applications and benefits? 7 M
(b) What are the hardware requirements of a Design workstation? Explain. 7 M
2. (a) What is geometric modeling? Compare and contrast the various modeling techniques. 5 M
(b) How are solid modelers categorized? Explain the generic architecture of any solid modeler. Name some popular solid modelers. 4 M
(c) Create the CSG model of the solid shown in the Fig. 1. 5 M

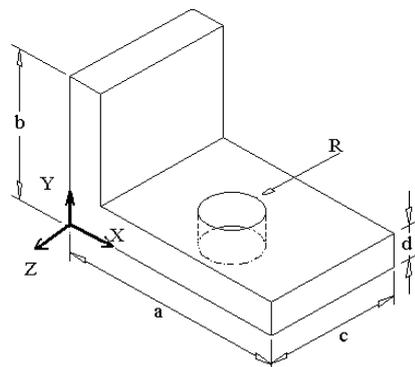


Fig. 1

3. (a) What is shading? How is the shading of CSG model achieved? Explain any one shading algorithm for solids. 7 M
(b) What do you understand by the term geometric modifier? Explain. Give some examples where layering concepts are useful. 7 M
4. (a) What is animation? Compare and contrast the conventional animation and computer animation. Write a brief note on animation techniques. 7 M
(b) Explain the procedure involved in animating a four bar linkage. 7 M
5. (a) What is geometric tolerancing? What are the types of geometric tolerances? How is it different from conventional tolerancing? Give a list of ANSI symbols for geometric tolerances? 7 M
(b) Fig.2 shows a part design with assigned tolerances. Use the arithmetic method to calculate the tolerance information for the axial dimension F of the outside surface shown. 7 M

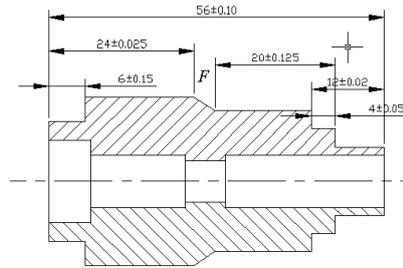


Fig. 2

6. (a) Generate the assembly tree and the precedence diagram for the assembly shown in the Fig.3. Count the number of all possible assembly sequences to create the assembly. 7 M

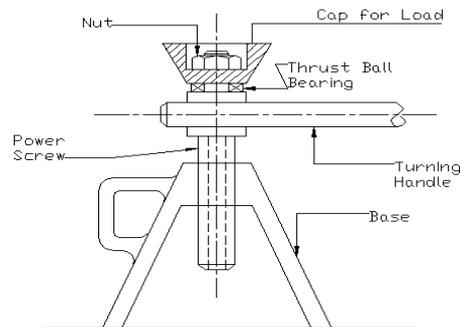


Fig. 3

- (b) What are the various techniques to generate all assembly sequences for a mechanical component? Explain Liaison sequence analysis. 7 M
7. (a) Derive the principal moments of inertia of an object given its moments about a co-ordinate system. 7 M
- (b) The geometry of an object is given in the following Fig. 4. Calculate the mass properties of the object assuming a density of 801.2 N/m^3 . 7 M

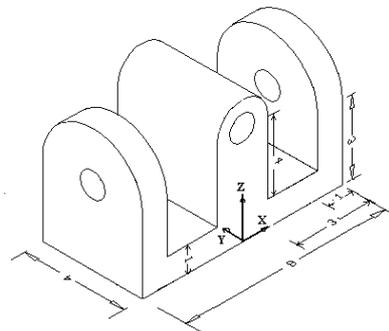


Fig. 4

8. Write a short note on the following
- (a) Boolean operations 4 M
- (b) Rendering a 3-D solid model 3 M
- (c) Rubber banding and dragging 3 M
- (d) extrusion with AutoCAD 4 M

[M16CAD1103]

I/II M.Tech. (CAD/CAM) I Semester Regular Examinations
MODEL QUESTION PAPER
COMPUTER NUMERICAL CONTROL TECHNOLOGY

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

- (a) What is NC? What are the major advantages of CNC machine tool compared to its conventional counterpart? 7 M

(b) How do you designate the coordinate axes for a CNC lathe? Show them diagrammatically on a rough sketch of a lathe. 7 M
- (a) How BCD system differs from Binary system? Explain how the eight track tape coding is specified in ISO and EIA. 7 M

(b) Explain important features of a CNC machining centre. 7 M
- (a) What is the function of a Transducer in CNC? Explain any one type of a Transducer. 7 M

(b) Explain the function of MCU and explain its organization to perform its functions. 7 M
- (a) Prepare manual part program for machining the component with 4 holes of 10 mm diameter on 60 mm p.c.d. as shown in Fig.1 using ISO code. Do not use G41 or G42. 14 M

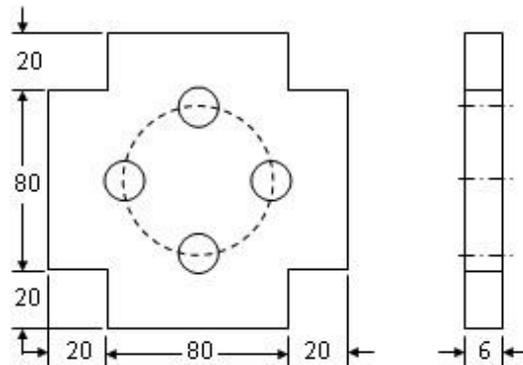


Fig. 1

- Prepare manual part programming for turning the component shown in Fig.2 on CNC lathe using ISO code. Assume the tool tip radius is 2 mm. 14 M

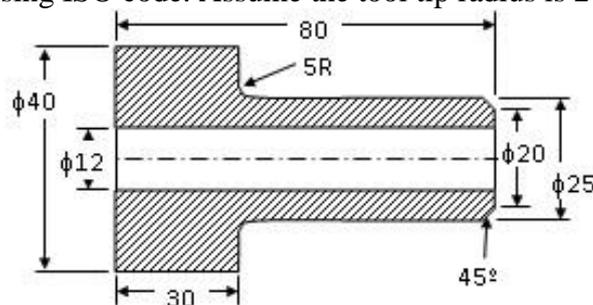


Fig. 2

6. (a) Give any six circle definitions in APT geometry. 7 M
 (b) Write APT geometry to define lines and circles shown in Fig.3. 7 M

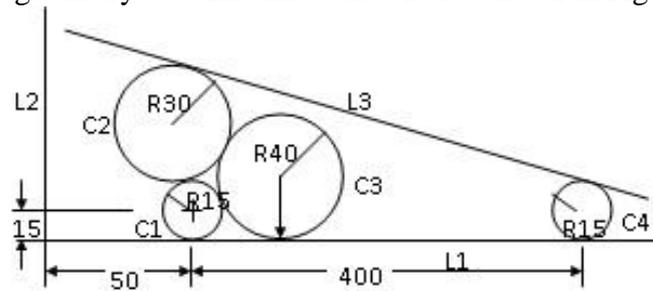


Fig. 3

7. Prepare NC program in APT for machining the contour shown in Fig.4 with two passes one with rough-cut and other with finish cut. 14 M

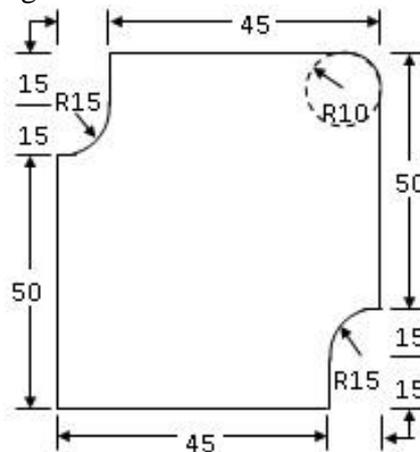


Fig. 4

8. Write a short note on the following
- (a) Servo system 4 M
 - (b) MATRIX definition in APT 4 M
 - (c) Tab sequential format 3 M
 - (d) Post processor 3 M

[M16CAD1103]

[M16CAD1104]
I/II M.Tech. (CAD/CAM) I Semester Regular Examinations
MODEL QUESTION PAPER
ROBOTICS

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

1. (a) Sketch and explain the four basic robot configurations classified according to the co-ordinate system. 8 M
(b) Show the appropriate work envelop for the same. 6 M
2. (a) Explain in detail about various drive systems used with in industrial robots. 7 M
(b) With suitable sketches, explain about various actuator sensors used in robots. 7 M
3. (a) With an example differentiate forward and inverse kinematics 7 M
(b) Explain the concept of redundancy in the context of robots. 7 M
4. (a) Explain briefly about any three types of range sensors used in robots. 8 M
(b) What are the factors to be considered in selection and design of grippers? 6 M
5. Using a simple program for a pick-and-place application, enumerate the features and default structure of VAL robot programming language. 14 M
6. (a) Explain the work cell control with examples in detail. 8 M
(b) Write the future applications of robots. 6 M
7. Describe the machine vision technique used in robotics with a neat block diagram. 14 M
8. Write a short notes on the following 14 M
 - (a) Robot Anatomy
 - (b) Object recognition in context of machine vision
 - (c) Importance of robots in assembly and inspection

[M16CAD1104]

[M16CAD1105]
 I/II M.Tech. (CAD/CAM) I Semester Regular Examinations
 MODEL QUESTION PAPER
ADVANCED OPTIMIZATION TECHNIQUES (Elective-I)

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
 All questions carry equal marks
 Assume any missing data with justification

1. Minimize the following function: 14M

$$f(X) = \frac{1}{2}x_1^2 + x_2 + \frac{2}{3}x_1^{-1}x_2^{-1}$$

2. Maximize: $Z = 50x_1 + 100x_2$
 Subject to: 14M

$$10x_1 + 5x_2 \leq 2500$$

$$4x_1 + 10x_2 \leq 2000$$

$$x_1 + 1.5x_2 \leq 450$$

$$x_1 \geq 0, \quad x_2 \geq 0$$

Solve by Dynamic programming recursive approach.

3. Solve the following IPP 14M

Minimize: $f = 7x_1 + 9x_2$

Subject to:

$$3x_1 + 4x_2 \leq 20$$

$$2x_1 + 5x_2 \leq 25$$

$$x_1 - x_2 \leq 5$$

$$x_i \geq 0 \text{ and integer, } i = 1, 2.$$

4. A contractor plans to use four tractors to work on a project in a remote area. The probability of a tractor functioning for a year without a breakdown is known to be 82%. If X denotes the number of tractors operating at the end of a year, determine the probability mass and distribution function of X and also find the expected value and the standard deviation of the number of tractors operating at the end of one year.

14M

5. Two products are manufactured on two machines. Table 1 gives the machining times in minutes per unit for the two products. Each machine runs 8 hours a day. Obtain the daily production quota using Goal programming method, if necessary using overtime.

Table 1

| Machine | Product 1 | Product 2 |
|---------|-----------|-----------|
| 1 | 7 | 5 |
| 2 | 8 | 4 |

14M

6. a) Differentiate GAs from conventional optimization techniques. 14M

b) Consider the following two strings denoting the vector X_1 and X_2

X_1 : {1 0 0 0 1 0 1 1 0 1}

X_2 : {0 1 1 1 1 1 0 1 1 0}

Find the result of crossover at location 2. Also, determine the decimal value of the variable before and after crossover if each string denotes a vector of two variables.

7. A vessel is to be loaded with three types of items. The maximum allowable weight is 10. The weight per unit of different items and their values are given in Table 2. It is required to find the loading which maximize the values of the vessel without exceeding the weight constraint of 10. 14M

Table 2

| Item | Weight/unit | Value/unit |
|------|-------------|------------|
| 1 | 1 | 25 |
| 2 | 2 | 70 |
| 3 | 2.5 | 65 |

8. Explain any THREE of the following. 14M

- a) Stochastic linear programming
- b) Simulated Annealing Algorithm
- c) Continuous Dynamic programming
- d) Prove arithmetic-geometric inequality
- e) Complementary Geometric programming.

[M16CAD1105]

[M16CAD1106]
I/II M.Tech. (CAD/CAM) I Semester Regular Examinations
MODEL QUESTION PAPER
NEURAL NETWORK & FUZZY TECHNIQUES (Elective-I)

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

1. (a) Describe the basic terminology involved in neural networks and fuzzy system. 7 M
(b) Compare and contrast the differences between biological neurons and artificial neurons 7 M
2. (a) Distinguish between local minima and global minima in neural networks and what are the effects of these on neural networks. 8 M
(b) Explain the distinction between stability and convergence. 6 M
3. Explain the architecture of Cohen-Grossberg models and its training algorithms. 14 M
4. What are the basic learning laws? Explain the weight updating rules in each learning law. 14 M
5. (a) What is adaptive vector quantization? What is learning vector quantization? Discuss. 8 M
(b) Discuss about Hebbian learning. 6 M
6. (a) Explain the geometry of fuzzy sets. 7 M
(b) Discuss about the classical measures of uncertainty and fuzziness 7 M
7. (a) Explain the entropy-subsethood theorem. 7 M
(b) Describe the FAM system architecture. 7 M
8. Write a short note on the following
(a) Back propagation algorithm 5 M
(b) BAM connection matrices 5 M
(c) Applications of fuzziness in structural analysis 4 M

[M16CAD1106]

[M16CAD1107]

**SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE::BHIMAVARAM
(AUTONOMOUS)**

I/II M.Tech. (CAD/CAM) I Semester Regular Examinations

MODEL QUESTION PAPER

TOOL DESIGN (Elective-I)

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

1. (a) Explain the role of tool design in manufacturing. 7 M
(b) Explain different types of fits and tolerance grades 7 M
2. (a) Explain the tool nomenclature of single point cutting tool. 7 M
(b) With a neat diagram explain the broaching tools. 7 M
3. What are the different types of gauges and explain in detail? 14 M
4. (a) What is blanking and piercing? And explain the selection of punch and die size in blanking and piercing. 7 M
(b) Write short notes on strippers, pressure plates and pilots. 7 M
5. (a) Explain the tooling requirement for numerical control systems. 7 M
(b) Explain briefly fixture design for CNC machine tools 7 M
6. (a) Explain in detail about spring back effect in bending. 7 M
(b) Explain briefly about tool presetting. 7 M
7. (a) Determine the sizes of GO and NOGO gauges for checking the components with $50H_7/f_8$ i.e., $50_{-0.00}^{+0.025}/50_{-0.119}^{+0.08}$. 7 M
(b) Explain different tooling materials used and their composition. 7 M
8. (a) Draw a neat sketch of a milling fixture and explain by indicating its parts. 7 M
(b) Briefly discuss about the automatic tool changers and positioners in CNC. 7 M

[M16CAD1107]

[M16CAD1108]

I/II M.Tech. (CAD/CAM) I Semester Regular Examinations
MODEL QUESTION PAPER

DESIGN OF HYDRAULIC & PNEUMATICS SYSTEMS (Elective-II)

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

1. (a) What is the difference between a variable displacement pump and fixed displacement pump? 6 M
(b) Where telescopic cylinder is preferred? Explain the working of telescopic cylinder with neat sketch. 8 M
2. (a) Draw the neat sketch of a compound relief valve and discuss its operation. What is its use? 7 M
(b) Briefly discuss the working and application of counter balance valve with suitable sketches. 7 M
3. (a) Construct a hydraulic circuit for earth mover and explain its working principle 8 M
(b) List and explain all the steps required for designing a hydraulic power unit. 6 M
4. (a) Explain the functioning of back pressure and proximity sensor with neat sketch. 8 M
(b) Discuss the functions of FRL unit 6 M
5. (a) Discuss the application of typical hydraulic circuit used in robotics. 7 M
(b) Sketch the various hydro pneumatic feed circuits and explain. 7 M
6. (a) With a neat sketch, explain the working of vane pump. 7 M
(b) Explain the construction and working of pilot operated check valve. 7 M
7. (a) Draw a neat sketch and explain the function of pressure intensifier circuit. 7 M
(b) Draw and explain the working principle of an air compressor. 7 M
8. Write a short note on the following
(a) Hydraulic fuse 5 M
(b) Hydraulic circuit for quick return mechanism 5 M
(c) Preventive maintenance 4 M

[M16CAD1108]

[M16CAD1109]
I/II M.Tech. (CAD/CAM) I Semester Regular Examinations
MODEL QUESTION PAPER
PRODUCT DESIGN (Elective-II)

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks
Assume any missing data with justification

- | | | |
|----|---|------|
| 1. | (a) What is need analysis? | 6 M |
| | (b) Explain different design specifications with suitable examples. | 8 M |
| 2. | (a) Explain different stages of product life cycle. Illustrate with a suitable example. | 8 M |
| | (b) Briefly enumerate the advantages of standardization. | 6 M |
| 3. | (a) Explain about notch sensitivity and stress concentration factor. | 6 M |
| | (b) A mechanical part is made of steel with the properties $S_u = 600$ MPa, $S_y = 200$ MPa. Determine the factor of safety for the following stress states (i) A bending stress alternating between 40 and 100 MPa; (ii) A bending stress alternating between 0 and 200 MPa; (iii) A pure axial and compressive stress which fluctuates between 0 and 200 MPa. | 8 M |
| 4. | (a) Explain the mechanism of fatigue failure. | 7 M |
| | (b) Explain various factors affecting fatigue life of a component. | 7 M |
| 5. | (a) Explain the design considerations for casting process with examples. | 7 M |
| | (b) Briefly explain design process for non-metallic parts. | 7 M |
| 6. | (a) Explain about break even analysis. | 7 M |
| | (b) What is manufacturability? Describe its significance in design for manufacturing. | 7 M |
| 7. | What is creativity? Explain the various creative techniques. | 14 M |
| 8. | Write a short note on the following | |
| | (a) Shigley model of design | 6 M |
| | (b) Design for reliability | 4 M |
| | (c) Material selection concepts | 4 M |

[M16CAD1109]

[M16CAD1110]
I/II M.Tech. (CAD/CAM) I Semester Regular Examinations
MODEL QUESTION PAPER
ADVANCED NUMERICAL METHODS (Elective-II)

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

1. (a) Explain the term pivoting 6 M
(b) Solve using Gauss Elimination 8 M
 $2x_1 + x_2 = 1; x_1 + 2x_2 + x_3 = 2; x_2 + x_3 = 4$
2. Find a real of equation $x^3 + x^2 - 1 = 0$ by iteration. 14 M
3. Solve the system of equation $u' = 3u + 2v, u(0) = 0, v' = 3u - 4v, v(0) = 0.5$ with $h = 0.2$ on the interval $[0, 0.4]$ using R.K method. 14 M
4. Using Shooting method solve the equation $y'' - 2y = 8x(9-x), y(0) = 0, y(9) = 0$. 14 M
5. Explain about Implicit method in detail. 14 M
6. Solve $u_{tt} = u_{xx}$ subject $u(0,t) = 0, u(1,t) = 0, u_t(x,0) = 0, u(x,0) = \sin\pi x, 0 < X < 1$ using finite difference method. 14 M
7. Solve $u_{xx} + u_{yy} = 0$ for (x,y) in the set $R = [(x,y) | 0 < x < 0.5, 0 < y < 0.5]$ with the boundary conditions $u(0,y) = 0, u(x,0) = 0, u(x,0.5) = 200x, u(0.5,y) = 200y$ using Liebmann's iterative method. 14 M
8. (a) Explain about Galerkin method with an example. 7 M
(b) Write short notes on FEM. 7 M

[M16CAD1110]

[M16CAD1201]
I/II M.Tech. (CAD/CAM) II Semester Regular Examinations
MODEL QUESTION PAPER
COMPUTER INTEGRATED MANUFACTURING

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

1. Discuss the reasons for the development of Automation and explain its impulse on manufacturing scenario. 14 M
2. Discuss with examples the following classification and coding systems 14 M
(i) Monocode; (ii) Polycode; (iii) Mixedcode
3. Discuss the various methods for developing part families 14 M
4. (a) Write the importance and functions of artificial intelligence in process planning. 7 M
(b) Explain the procedure involved in Retrieval type CAPP. 7 M
5. What do you understand by cellular manufacturing and JIT? Explain. 14 M
6. (a) Differentiate between contact and non-contact type inspection methods. 7 M
(b) Explain how Machine Vision system is useful in industrial inspection. 7 M
7. Discuss the scope of Computer Integrated Manufacturing in manufacturing industry. 14 M
8. Write a short note on the following
(a) Product Cycle 4 M
(b) Economics of GT 3 M
(c) DCLASS 3 M
(d) CAQC 4 M

[M16CAD1201]

[M16CAD1202]
I/II M.Tech. (CAD/CAM) II Semester Regular Examinations
MODEL QUESTION PAPER
MECHATRONICS

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

1. (a) What are the basic types of stepper motors used in mechatronics and explain about any two in brief. 7 M
(b) Write the comparison between traditional and mechatronic design 7 M
2. What is mechatronics? Discuss in detail about mechatronics key elements with the help of block diagram. 14 M
3. (a) Explain analogies and impedance diagrams. 7 M
(b) What are fluid systems and explain about it. 7 M
4. (a) What are the different parameter measurements in sensors and transducers? 7 M
(b) Explain temperature measuring devices 7 M
5. (a) Explain briefly about different forms of system representation. 7 M
(b) Explain how a nonlinear function can be linearized in a block diagram. 7 M
6. (a) Discuss the elements of a data acquisition and control systems. 7 M
(b) Explain the installation of I/O card and software. 7 M
7. (a) Explain mechatronic controls in automated manufacturing. 7 M
(b) Explain the artificial neural networks in mechatronics. 7 M
8. Write a short note on the following
(a) Advanced approaches in mechatronics 4 M
(b) Micro sensor fabrication technique 3 M
(c) Brushless D.C. motors 3 M
(d) Electro mechanical couplings 4 M

[M16CAD1202]

[M16CAD1203]

I/II M.Tech. (CAD/CAM) II Semester Regular Examinations
MODEL QUESTION PAPER

FLEXIBLE MANUFACTURING SYSTEMS

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

1. (a) Write a short note on the basic components of Flexible Manufacturing Systems. 7 M
(b) With neat sketch explain the term “Concept of Total system”. 7 M
2. (a) Describe the various steps involved in simulation techniques while designing FMS. 7 M
(b) Explain briefly four levels of FMS project and software documentation. 7 M
3. Explain the Artificial Intelligence techniques used in designing and running the FMS. 14 M
4. What is distributed system? Describe the components of a distributed DBMS in FMS. 14 M
5. Explain in detail about “FMS clamping device and fixture data base”. 14 M
6. Explain about mating surface description methods for automated design robotized assembly. 14 M
7. Write the applications of Industrial robots with neat sketches. 14 M
8. Discuss the salient features of Contact sensors used in inspection. 14 M

[M16CAD1203]

[M16CAD1204]

I/II M.Tech. (CAD/CAM) II Semester Regular Examinations
MODEL QUESTION PAPER
FINITE ELEMENT ANALYSIS

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks
Assume any missing data with justification

- (a) Differentiate between plane stress and plane strain problems. 6 M

(b) Derive the stress and strain relations for a 3D system. 8 M
- (a) Discuss in detail about the general procedure of FEM formulation with an example. 5 M

(b) Derive the elemental stiffness matrix for one dimensional quadratic element. 9 M
- (a) Differentiate between Bar and Truss elements in FEM formulation. 5 M

(b) For the two-bar truss shown in Fig. 1, determine the displacements of node 1 and the stress in element 1-3. 9 M

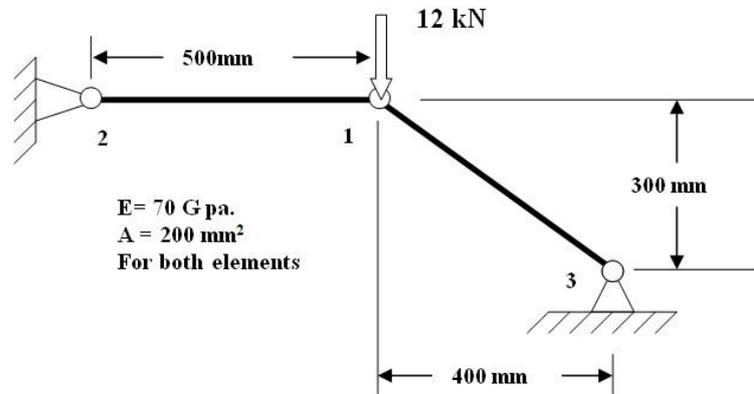


Fig. 1

- A beam of 10 m length is fixed at one end and supported by a roller at the other end has a 20 KN concentrated load applied at the centre of the span. Calculate the deflection under the load and construct the shear force and bending moment diagrams for the beam. Assume $E = 20 \times 10^5 \text{ N/mm}^2$ and $I = 2500 \text{ cm}^4$. 14 M
- Derive the shape functions for the following higher order elements (i) Nine Nodded Quadrilateral Element (ii) Eight Nodded Quadrilateral Element (iii) Six Nodded Triangular Element 14 M
- For the triangular plate shown in Fig. 2, determine the deflection at the point of load application and also stress induced in the plate using a one element model by considering it as plane stress problem. 14 M

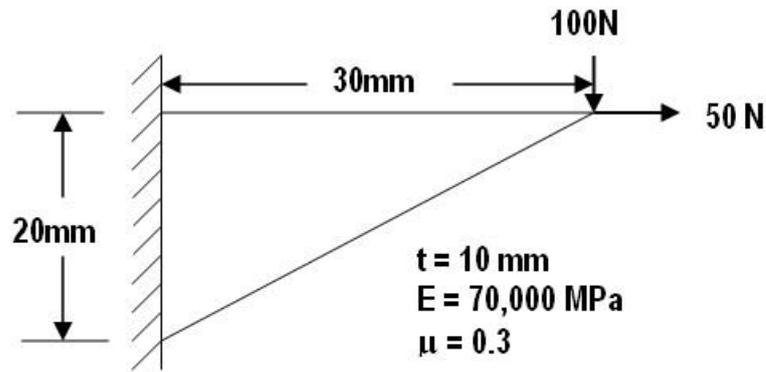


Fig. 2

7. A composite wall consists of three materials shown in Fig. 3. The outer temperature is 20°C . Convection heat transfer takes place on the inner surface of the wall with $h = 20 \text{ W/m}^2\text{ }^{\circ}\text{C}$ and $T_{\alpha} = 1000^{\circ}\text{C}$. Determine the temperature in the wall. Assume $k_1 = 20 \text{ W/m }^{\circ}\text{C}$, $k_2 = 30 \text{ W/m }^{\circ}\text{C}$ and $k_3 = 40 \text{ W/m }^{\circ}\text{C}$. 14 M

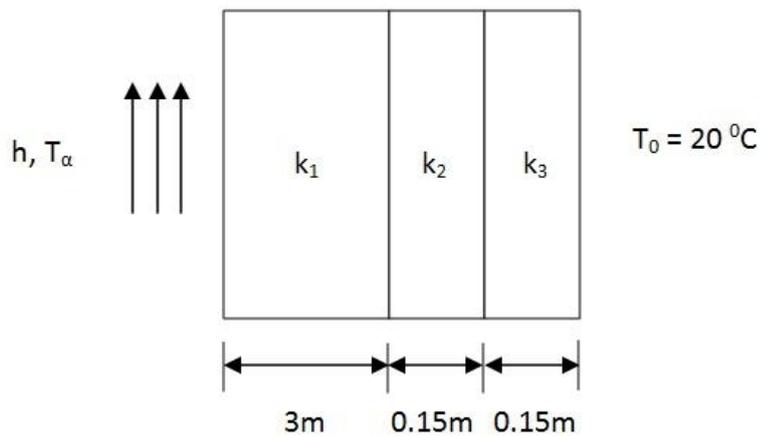


Fig. 3

8. Determine the natural frequencies and mode shapes for the stepped bar shown in Fig. 4. Take $E = 70 \text{ GPa}$ and specific weight 2700 kg/m^3 . 14 M

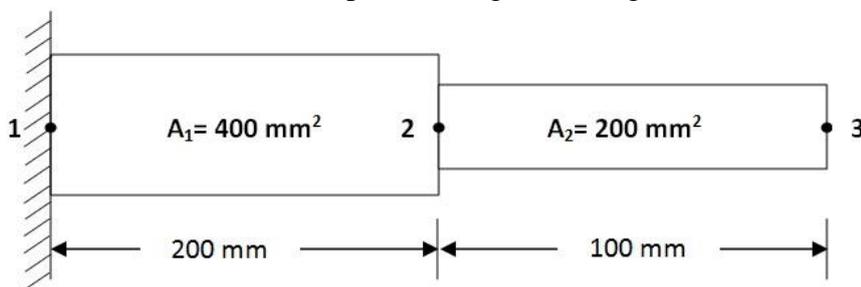


Fig. 4

[M16CAD1204]

[M16CAD1205]

I/II M.Tech. (CAD/CAM) II Semester Regular Examinations

MODEL QUESTION PAPER

VISION SYSTEMS & IMAGE PROCESSING (Elective-III)

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.

All questions carry equal marks

- | | | |
|----|---|-----|
| 1. | (a) Explain the applications of machine Vision. | 7 M |
| | (b) Explain the principle of Working of vision Sensors. | 7 M |
| 2. | (a) Explain the steps involved in image processing. | 7 M |
| | (b) What is meant by image recognition? Explain. | 7 M |
| 3. | (a) Explain the various lightning techniques. | 7 M |
| | (b) What is image sampling? Explain. | 7 M |
| 4. | (a) Explain in details about Digitization. | 7 M |
| | (b) Explain about the spatial Domain Technique. | 7 M |
| 5. | (a) Explain Hough Transformation in Detail. | 7 M |
| | (b) Explain about image Quantization. | 7 M |
| 6. | (a) Explain about image Restoration | 7 M |
| | (b) Explain in detail about image Segmentation. | 7 M |
| 7. | (a) Explain the process of Edge Detection. | 7 M |
| | (b) Explain about Thresholding. | 7 M |
| 8. | Write a short note on the following | |
| | (a) Scene matching | 4 M |
| | (b) Convolution | 3 M |
| | (c) Region growing | 3 M |
| | (d) Walsh transform | 4 M |

[M16CAD1205]

[M16CAD1206]
I/II M.Tech. (CAD/CAM) II Semester Regular Examinations
MODEL QUESTION PAPER
INTELLIGENT MANUFACTURING SYSTEMS (Elective-III)

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

1. (a) What are the various components of CIM & mention its advantages & limitations? 7 M
(b) Describe the importance of CAD, CAPP & CAM and their effects on quality and quantity of production. 7 M
2. (a) What is the need of manufacturing automation protocol and technical office protocol in implementing the networks. 7 M
(b) Differentiate between conventional and intelligent manufacturing systems. 7 M
3. (a) What are the advantages of knowledge based systems and mention its applications in CIM? 7 M
(b) What are the various knowledge acquisition systems are used in practice and mention its draw backs? 7 M
4. (a) How the artificial neural networks are used in the automated manufacturing? 7 M
(b) What are the various methods of CAPP and explain the retrieval type computer aided process planning systems? 7 M
5. (a) Differentiate between retrieval type and generative type computer aided process planning systems and mention their advantages. 7 M
(b) Describe the knowledge based system an equipment selection (KBSEB) and mention the structure and problem solving. 7 M
6. (a) How the features of the component be recognized and sequence of operations for process planning be done? 7 M
(b) What is the importance of group technology and mention the algorithms for cluster analysis method. 7 M
7. (a) Differentiate between cluster identification method and knowledge based group technology. 7 M
(b) Describe the structure of knowledge base system for group technology. 7 M
8. Write a short note on the following
(a) Computer aided quality control. 5 M
(b) System architecture & data flow. 4 M
(c) Artificial intelligence in CIM. 5 M

[M16CAD1206]

[M16CAD1207]
I/II M.Tech. (CAD/CAM) II Semester Regular Examinations
MODEL QUESTION PAPER
CONCURRENT ENGINEERING (Elective-III)

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

1. (a) Discuss the importance of various principles of concurrent engineering. 7 M
(b) Explain about various elements of concurrent engineering in detail. 7 M
2. Discuss in detail the modern methodologies and tools which are used in managing concurrent engineering. 14 M
3. (a) Explain briefly the principles of material handling 7 M
(b) Explain with an example how can we do assembly sequencing with toleranced parts. 7 M
4. (a) Explain importance of group technology in system feasibility analysis. 7 M
(b) Discuss about assembly resource alternatives. 7 M
5. Explain about roller and skate wheel conveyors and also belt conveyors which are used in material transport systems. 14 M
6. Explain about various issues in assembly workstation design. 14 M
7. (a) What are the objectives of modern fabrication system design? 7 M
(b) Explain about human resource considerations in design of automated fabrication systems. 7 M
8. Write a short note on the following
(a) Load stabilizing system 4 M
(b) Fixed & variable path conveying 3 M
(c) Part feeding alternatives 3 M
(d) Automobile air conditioning module 4 M

[M16CAD1207]

[M16CAD1208]

I/II M.Tech. (CAD/CAM) II Semester Regular Examinations

MODEL QUESTION PAPER

SIGNAL ANALYSIS & CONDITION MONITORING (Elective-IV)

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.

All questions carry equal marks

1. (a) Explain in detail about fourier analysis. 7 M
(b) Discuss in detail about Signal types. 7 M
2. (a) Explain in detail about Analog analyzer types. 7 M
(b) Discuss in detail about detectors and recorders. 7 M
3. (a) Explain in detail about stepped filter analysis. 7 M
(b) Discuss in detail about real-time analysis. 7 M
4. (a) Explain in detail about choice of window type. 7 M
(b) Discuss in detail about choice of incremental step. 7 M
5. (a) Explain about analysis by repeated playback for variable bandwidth. 7 M
(b) Discuss about analysis of periodic signals. 7 M
6. (a) Explain in detail about convolution. 7 M
(b) Discuss about condition monitoring of two stage compressor. 7 M
7. (a) Explain the condition monitoring of cooling tower fan. 7 M
(b) Discuss about condition monitoring of cement mill foundation 7 M
8. Write a short note on the following
(a) Bandwidth 3 M
(b) ISO standards on vibrations 4 M
(c) Diagnostic tools 4 M
(d) condition monitoring of air separator 3 M

[M16CAD1208]

[M16CAD1209]
I/II M.Tech. (CAD/CAM) II Semester Regular Examinations
MODEL QUESTION PAPER
ADDITIVE MANUFACTURING (Elective-IV)

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks

1. (a) Classify and explain the AM process. 7 M
(b) Explain in brief about virtual prototyping and rapid tooling 7 M
2. (a) Explain the concept of reverse engineering. 7 M
(b) Explain the geometric modeling techniques. 7 M
3. (a) Explain the working principle of FDM. 7 M
(b) Explain the working principle of LOM. 7 M
4. (a) Explain the applications of SLS and its processing techniques. 7 M
(b) What are the processing techniques used in LENS? 7 M
5. (a) Explain the working principle of 3DP. 7 M
(b) Differentiate between SDM and EBM. 7 M
6. (a) Explain the transition of RP to AM 7 M
(b) What is part orientation? Explain with illustrations. 7 M
7. (a) Write briefly about strength, weakness and applications of SGC. 7 M
(b) What is SLS? Explain the same. 7 M
8. Write a short note on the following
(a) Ballistic Particle Manufacturing (BPM) 5 M
(b) Additive Manufacturing 4 M
(c) Advantages and Limitations of LENS. 5 M

[M16CAD1209]

[M16CAD1210]

I/II M.Tech. (CAD/CAM) II Semester Regular Examinations

MODEL QUESTION PAPER

METROLOGY AND NON DESTRUCTIVE TESTING (Elective-IV)

Time: 3 Hours

Max. Marks: 70

Answer any FIVE questions.

All questions carry equal marks

1. (a) With the help of a neat diagram explain the principle and working of Tool maker's microscope. 7 M
(b) How do you measure pitch of the screw using tool makers Microscope? 7 M
2. (a) With the help of sketches classify different types of Co-ordinate measuring machines. 8 M
(b) Write the advantages & disadvantages of Co-ordinate measuring machines. 6 M
3. (a) Explain the use of computers and microprocessors in metrology. 7 M
(b) Explain about machine vision technology. 7 M
4. Explain any four data representation techniques with examples. 14 M
5. Find the UCL and LCL with the following formulas: $UCL = \bar{D}(4)R\bar{B}\bar{A}R$ and $LCL = \bar{D}(3)R\bar{B}\bar{A}R$ with $D(3)$ and $D(4)$ can be found in the following table:
Table of $D(3)$ and $D(4)$

| n | $D(3)$ | $D(4)$ | n | $D(3)$ | $D(4)$ |
|---|--------|--------|---|--------|--------|
| 2 | 0 | 3.267 | 6 | 0 | 2.004 |
| 3 | 0 | 2.574 | 7 | .076 | 1.924 |
| 4 | 0 | 2.282 | 8 | .136 | 1.864 |
| 5 | 0 | 2.114 | 9 | .184 | 1.816 |
6. (a) Explain about ultrasonic testing method with the help of sketches. 7 M
(b) Explain about ABC scans. 7 M
7. Explain about magnetic particle inspection technique and also write its advantages and limitations. 14 M
8. Write a short note on the following
 - (a) Image shearing microscope uses 3 M
 - (b) Mean and mode with examples 4 M
 - (c) Type1 and type 2 errors 4 M
 - (d) Liquid penetrates 3 M

[M16CAD1210]