Ex. Library

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

END SEMESTER RE-EXAMINATION

JUNE 2017

Q. P. Code:

Max. Marks: 100 Duration: 4 Hour

Class: M.Tech(Mechanical) with Machine Design Semester: I Program:

Name of the Course: Elective I -Computer Aided Design Course Code : MTMD111

Master file.

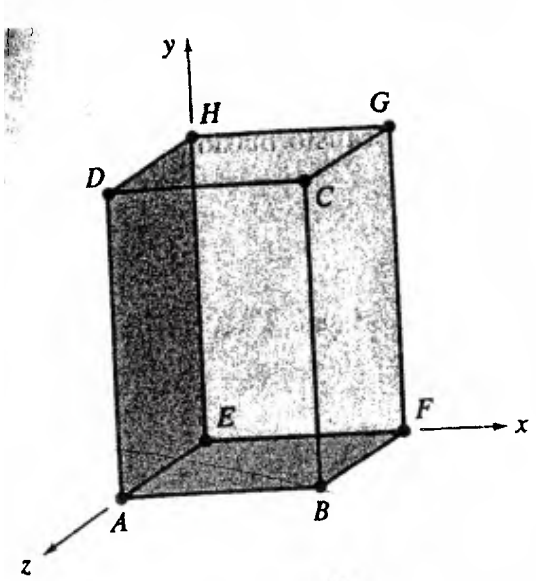
Instructions:

1. Answer any five questions.
2. Assume suitable additional data if necessary and state the same.

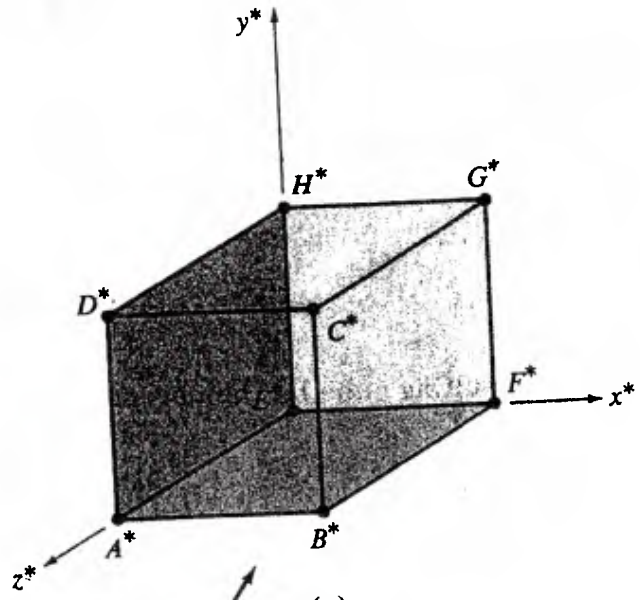
Question No		Maximum Marks	Course Outcome	Module No
Q 1	a) Consider the Fig.1.Calculate and sketch what will appear on the screen for each of the following Window and View Port settings. a) SET VIEWPORT (0,1,0,0.5) SET WINDOW (0,1,0.5,1) b) SET VIEWPORT (0,0.5,0,0.5) SET WINDOW (0,1,0,1)	10	01	03
	b) Explain the following for hidden surface removal. i) Z Buffers ii) Painter's Algorithm	10	02	03
Q2	a)Calculate (x, y) coordinates of Bezier curve described by the following 4 control points: (0,0), (1,2), (3,3), (4,0).Assume the number of steps is set to 8 for a smoother curve.	10	04	04
	b) Explain in detail the main points involved in Design for Assembly and Disassembly.	10	03	03

Q3	a) Use the parametric representation to generate eight points on the hyperbola segment in the first quadrant with a=1, b=1 for 1≤ x ≤ 10.	10	03	02
	b) Vectorize a line to be drawn from (10 , 15) to (150 , 125) mm on a display which is mapped to (300 * 250 mm). The resolution of the screen is 640 * 480 pixels. Use Bresenham's Algorithm.	10	05	04
Q4	a) Consider the rectangular parallelepiped(RPP) shown in the Fig.2 with homogenous position vectors. First transform the RPP by local scaling to a unit cube. Conduct the transformation for uniformly scaling the unit cube by a factor of two(doubling the size).	10	03	02
	b) The various design- related tasks which are performed by a modern computer applied design system can be grouped into four functional areas: • Geometric Modeling • Engineering Analysis • Design Review and Evaluation • Automated Drafting. Briefly explain each of these four areas.	10	04	01
Q5	Explain the following(any four):- a) Parametric Modeling b) Constraint Driven Modeling c) Artificial Intelligence in Design d) Knowledge Base Engineering e) Collaborative Engineering f) Data Capture Techniques like Contact Inspection Methods and Scanning Methods.	(5 each)	 02 01 04 04 03 02	 05 02 05 06 07 06
Q6	a)List the various hardware components that make up a modern CAD system and briefly explain each.	10	01	01
	b)IGES has three data types :geometric, annotation and structure. Explain these three data types.	10	02	02

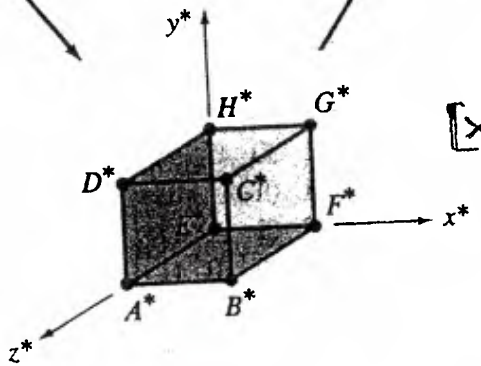
Q7	a)Write the steps in detail for creating a Spur Gear with the following specifications:- Module ---------- 4 Number of Teeth---------- -32 Pressure Angle---------- 20 deg Gear Face Width----------25mm Bore Diameter----------30 H 8 Material---------- EN 8 Steel. (Use the guidelines in the CAD packages UG NX, Solid works, CATIA or ProE for modeling technique)	12	03	07
	b) Develop a C ++ program to carry out following transformations on a 2D object like a line. Insert necessary comments wherever it is necessary. a) Translation b) Rotation	08	05	03



(a)



(c)



(b)

$$[X] = \begin{vmatrix} 0 & 0 & 1 & 1 \\ 2 & 0 & 1 & 1 \\ 2 & 3 & 1 & 1 \\ 0 & 3 & 1 & 1 \\ 0 & 0 & 0 & 1 \\ 2 & 0 & 0 & 1 \\ 2 & 3 & 0 & 1 \\ 0 & 3 & 0 & 1 \end{vmatrix}$$

Fig. 2 Q 4(a)

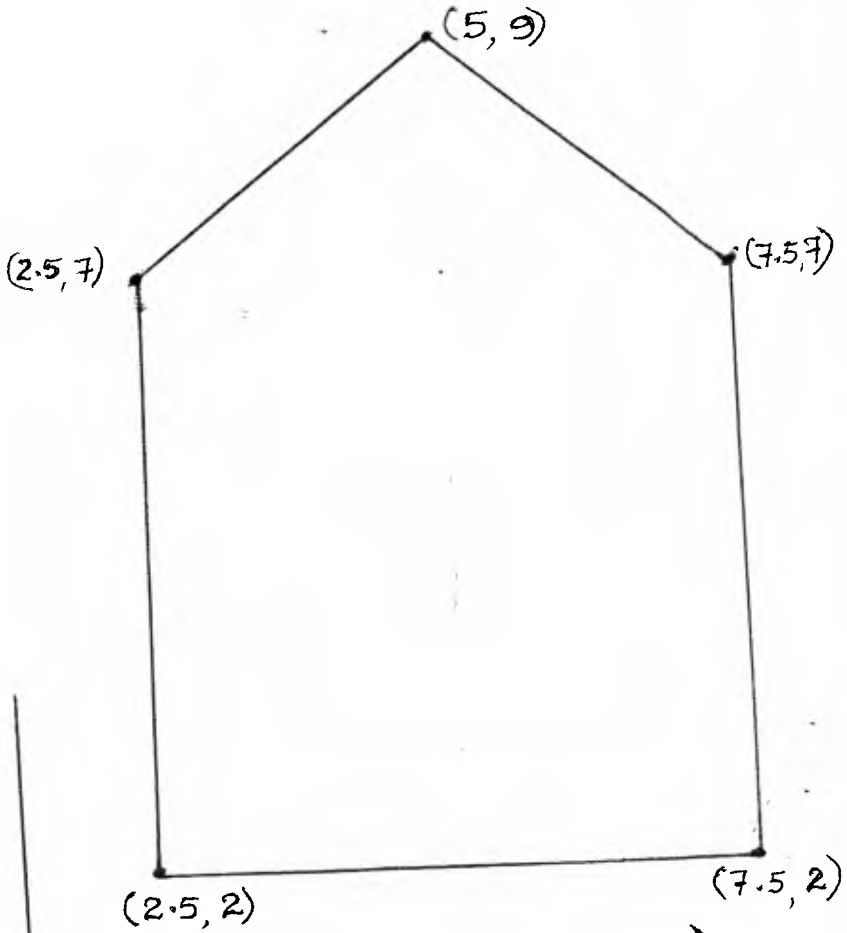


Fig. 1 (Q. 1(a))