B.E. Seventh Semester (Computer Science & Engineering) (C.B.S.)
Elective - II : Computational Geometry

P. Pages : 2   **NKT/KS/17/7493**

Time : Three Hours

Max. Marks : 80

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Notes : 1.   All questions carry marks as indicated.
         2.   Solve Question 1 OR Questions No. 2.
         3.   Solve Question 3 OR Questions No. 4.
         4.   Solve Question 5 OR Questions No. 6.
         5.   Solve Question 7 OR Questions No. 8.
         6.   Solve Question 9 OR Questions No. 10.
         7.   Solve Question 11 OR Questions No. 12.
         8.   Assume suitable data whenever necessary.
         9.   Illustrate your answers whenever necessary with the help of neat sketches.


1. a) Explain line segment intersection in view of computational geometry.   **7**

     b) Differentiate between   **6**

         i)   Convex and concave in view of computational geometry.

         ii) Plane and 3-D line.

         iii) Classical and computational geometry.

OR

2. a) Explain the algorithm find Intersections (s) with example.   **10**

     b) What is triangulation?   **3**

3. a) What is the orthogonal range searching? Explain one dimensional range searching. **7**

     b) Differentiate between chain and slab methods for Location of point in a plane subdivision bright lighting data structure employed and computational complexity. **7**

OR

4. a) Consider a triangle PQR described by vectors $\overrightarrow{PQ}$, $\overrightarrow{QR}$, and $\overrightarrow{PR}$. Explain how to derive equation of a plane containing this triangle with the information supplied. If the above information is not sufficient what more information would be required.   **8**
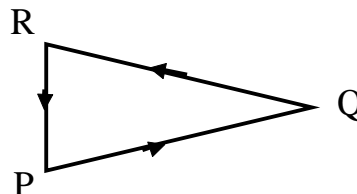
	b)	Differentiate between	**6**
		i) K d-trees and Range trees.	
		ii) Incremental linear programming and Randomize linear programming.	
5.	a)	What is Voronoi diagram? What is the significance of the Voronoi diagram.	**7**
	b)	Explain Randomize incremental algorithm.	**6**

OR

6.	a)	Explain the algorithm and its significance for hidden line problem.	**7**
	b)	Explain point location and trapezoidal maps.	**6**
7.	a)	What is Delaunay triangulations? Give the mathematical computations for the same.	**7**
	b)	Differentiate between data structure and Geometric data structure.	**6**

OR

8.	a)	Explain priority search tree with suitable example.	**7**
	b)	Explain internal trees.	**6**
9.	a)	Give an algorithm that uses the BSP tree that report all the faces of the subdivision intersected by axis-parallel query rectangle.	**7**
	b)	How to construct BSP tree? Explain with suitable example.	**6**

OR

10.	a)	What is the role of painter's algorithm? Explain in brief.	**7**
	b)	Explain BSP trees with diagram.	**6**
11.	a)	Give definition and block diagram of quadtrees for point set.	**7**
	b)	Explain significance of multilevel partition trees.	**7**

OR

12.	a)	Explain cutting trees.	**7**
	b)	Explain simplex Range searching.	**7**

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