B.E. (Computer Science & Engineering) Seventh Semester (C.B.S.)

Elective-II : Computational Geometry

P. Pages : 2 **NIR/KW/18/3577**

Time : Three Hours * 1 9 1 5 * Max. Marks : 80

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.

1. a) What is triangulation? Describe the following. **7**

a) Angular triangulation.

b) Point-Set triangulation.

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

OR

2. a) Discuss two fields of application of computational geometry highlighting why classical geometry can't be applied in such field. **7**

b) Explain Doubly connected Edge list. **7**

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

b) Discuss linear programming with prune and search in detail. **6**

OR

4. a) Discuss half plane intersection in view of computational geometry. **7**

b) What is trees? Explain higher dimensional range trees. **6**

5. a) Define the following terms: **7**

i) Duality.

ii) Levels and discrepancy.

b) Explain point location & trapezoidal maps. **6**

OR

6. a) What is Voronoi diagram? What is the significance of the Voronoi diagram. **7**

b) Explain application of randomized incremental algorithm. **6**

7.	a)	What is priority search trees? Explain with suitable example.	**7**
	b)	How to compute the Delaunay triangulation.	**6**

OR

8.	a)	Difference between data structure and Geometric data structure.	**5**
	b)	Explain data structure and application of internal trees and segment trees.	**8**
9.	a)	Define binary space partition trees. Explain with suitable example.	**7**
	b)	Explain BSP trees with diagram.	**6**

OR

10.	a)	What is the role of painter's algorithm? Explain in brief.	**7**
	b)	Discuss the advantages and dis-advantages of BSP trees over Kd-trees.	**6**
11.	a)	Explain the significance of multi-level partition trees.	**7**
	b)	Write short note on simplex Range searching.	**7**

OR

12.	a)	Explain cutting trees.	**7**
	b)	Give definition and block diagram of quadtrees for point set.	**7**

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