

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID :110661

Roll No.

B.TECH.

Theory Examination (Semester-VI) 2015-16

COMPUTATIONAL GEOMETRY

Time : 3 Hours

Max. Marks : 100

Section-A

Attempt all parts of this section. Answer in brief. (2×10=20)

- Q.1. (a) Write any two properties of Bezier Curve.
- (b) Discuss in brief one dimensional range searching problem.
- (c) Give difference between plane and 3-D line.
- (d) Briefly explain the impact of model of computation on complexity of a geometric operation?
- (e) Define union and intersection of a set of rectangles.
- (f) Describe hidden surface problem.

- (g) What do you understand by separating chains?
- (h) Why convex is designed separately from concave in context of computational geometry?
- (i) Discuss significance of rectangle in the field of computational geometry?
- (j) Differentiate between classical and computational geometry

Section-B

Q.2. Attempt any five questions from this section.

(10×5=50)

- (a) With help of a suitable example explain the impact of model of computation on complexity of a geometric operation.
- (b) Discuss two fields of applicational computational geometry highlighting. Why classical geometry cannot be applied in such fields?
- (c) Contrast chain and slab methods for location of a EXiflt in a planar subdivision weightlifting data structure employed and computational complexity.
- (d) Derive an algorithm to determine bounding rectangle of an arbitrary rectangle.

- (e) What is convex hull? Discuss the orientation and limitation of convex hull in detail.
- (f) What is triangulation? Describe the following.
 - (i) Angular triangulation
 - (ii) Point-set triangulations
- (g) Contrast 'Divide and conquer approach' with 'Locus approach'.
- (h) Discuss hidden line problem and an algorithm for same.

Section-C

Attempt any two questions from this section. (15×2=30)

Q3. For given triangle develop an algorithm to indicate if a point P is internal or external. For an external point the algorithm must be able to tell the side with respect to plane containing triangle.

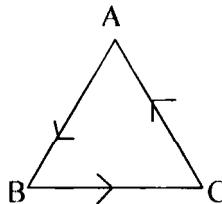


Fig. 3

- Q4. Discuss one dimensional range searching problem. Explain how this can be extended to multi dimensional range searching. Discuss quick hull technique with suitable example.
- Q5. What is geometric searching? Discuss point location and fractional cascading in detail. What is significance of Robust geometric computing in computational geometry?

