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B.TECH.
THEORY EXAMINATION (SEM–VI) 2016-17
COMPUTATIONAL GEOMETRY

Time : 3 Hours *Max. Marks : 100*

Note : *Be precise in your answer. In case of numerical problem assume data wherever not provided.*

SECTION-A

Explain the following : **(10×2=20)**

a) Fortune's sweep
b) Minimum Spanning Tree
c) Separating Chains
d) Reflections
e) Perspective projection
f) Delayney Triangulations
g) Quick Hull
h) Planar Graphs
i) Interval trees
j) Segment trees

SECTION-B

Attempt any five of the following : **(10×5=50)**

a) What is convex hull? Discuss the orientation and limitation of convex hull in detail.
b) What is triangulation? Describe the following.
  i) Angular triangulation
  ii) Point-set triangulations.
c) What do you understand by divide and conquer? Discuss flip and incremental algorithm in detail.
d) What is visibility? Discuss algorithms for weak and strong visibility.
e) Define and explain voronoi diagrams . What are its basic properties?
f) Discuss zone theorem in detail.
g) Explain higher dimensional range searching with example.
h) What is robust geometric computing? Discuss with example.

SECTION-C

Attempt any twoof the following : **(15×2=30)**

3 Differentiate between:
  i) Classical and computational geometry
  ii) Plane and 3D line
  iii) Convex and concave in context of computational geometry
What are sweep techniques? Also discuss these algorithms:
  i) Plane sweep for segment intersections
  ii) Topological sweep for line arrangements
Write short notes on the following:
  i) Ham-Sandwich cuts.
  ii) Fractional Cascading.
  iii) Concatenable queues

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