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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST - 2 EXAMINATION - APRIL 2019

B.Tech VI Semester

COURSE CODE: 11B1WCI611 MAX. MARKS: 25

COURSE NAME: Computer Graphics

COURSE CREDITS: 04 MAX. TIME: 1.5 Hrs

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

Section – A (2X4 = 8 Marks)

1. Determine a sequence of basic transformations that is equivalent to the x-direction shearing matrix.
2. Are uniform scaling and rotation forming a commutative pair of operation? Justify your answer with a proof.
3. Write the geometric tables for a unit cube with a vertex located at the origin.
4. Define the following terms:
   a) Pixel phasing
   b) Area Sampling

Section – B (3X4 = 12 Marks)

5. Consider a square with vertices (0, 3), (0, 5), (2, 3) and (2, 5). Derive two different methods to reflect it about the line y = - x.
6. Elaborate the method for rotating an object in 3-D about an axis that is neither parallel to standard axis nor passes through origin.
7. Consider a situation of an octagonal concave clipping boundary, where it is required to clip an arbitrary shaped polygon against it. Devise an algorithm (in detail) for performing the above task.
8. A scenario containing different objects is detailed with their geometrical dimensions. Devise the steps in detail for displaying the scenario over a targeted 2-dimension display device.

Section – C (1X5 = 5 Marks)

9. Consider the line segment joining the two points (-1, 1) and (5, 7) with a rectangular clipping window with two opposite end points as (1, 2) and (4, 4). Using the Liang-Barsky line clipping algorithm clip the line against the clipping window. Elaborate each step of the algorithm while solving the problem and carefully discuss the rationale behind the test performed in each step.