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## Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Computer Graphics and Visualization

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing one full question from each module.*

### Module-1

- 1 a. What is Computer Graphics? Explain the applications of computer graphics. (05 Marks)
- b. Illustrate the sequence of coordinate transformations from modeling coordinates to device-coordinates. (05 Marks)
- c. Explain DDA line drawing algorithm with procedure. (06 Marks)

**OR**

- 2 a. Explain the basic operation of CRT with its primary components with neat diagram. (08 Marks)
- b. Digitize the line by using Bresenham's line drawing algorithm with end-points (20, 10) and (30, 18), having slope 0.8. (08 Marks)

### Module-2

- 3 a. How do you classify the polygon? Explain OpenGL polygon fill primitives. (07 Marks)
- b. Explain translation, scaling, rotation in 2D homogeneous coordinate system with matrix representations. (09 Marks)

**OR**

- 4 a. Explain general scan-line polygon-fill algorithm in detail. (10 Marks)
- b. What are the entities required to perform a rotation? Show that two successive rotations are additive. (06 Marks)

### Module-3

- 5 a. Define clipping. Briefly explain Co-hen Sutherland line clipping without code. Discuss four cases. (10 Marks)
- b. Describe phong lighting model. (06 Marks)

**OR**

- 6 a. Clip the polygon given in Fig.Q.6(a), using Sutherland Hodgman polygon clipping algorithm with neat sketches. (06 Marks)

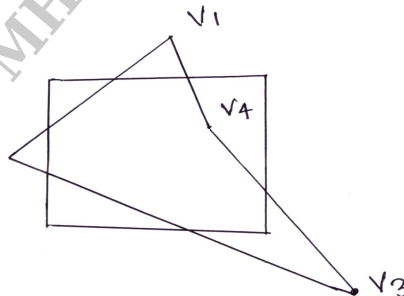


Fig.Q.6(a)

- b. Explain the different types of light sources supported by OpenGL. (06 Marks)
- c. Explain the RGB and CMY color models. (04 Marks)

**Module-4**

- 7 a. Explain the perspective projections with reference point and vanishing point with neat diagrams. (10 Marks)
- b. Discuss depth-buffer method with algorithm. (06 Marks)

**OR**

- 8 a. Demonstrate how transformation from world coordinates to viewing coordinates with matrix representation. (06 Marks)
- b. Explain orthogonal projections in detail. (10 Marks)

**Module-5**

- 9 a. Explain the major characteristics that describe the logical behaviour of an input device. Explain how OpenGL provides the functionality of each of the classed of logical input devices. (08 Marks)
- b. Describe the logical input operation of picking in selection mode. (04 Marks)
- c. What is DisplayList? Write OpenGL code-segment that generate a blue colored square using display list. (04 Marks)

**OR**

- 10 a. Explain Bezier spline curves with equations and demonstrate the appearance of Bezier curves for various selection of control points. (08 Marks)
- b. What is double buffering? How it is implemented in OpenGL. (04 Marks)
- c. Differentiate event mode with request mode. (04 Marks)

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