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B.E. / B.Tech. DEGREE EXAMINATION, NOV / DEC 2013

B.E. COMPUTER SCIENCE AND ENGINEERING

5

CS9401-GRAPHICS AND MULTIMEDIA

SEMESTER – 7

REGULATION – R2008

Time: Three hours

Maximum: 100 marks

Answer ALL Questions

PART - A (10 x 2 = 20 Marks)

1. Compare Sample mode and Request mode of acquiring inputs.
2. The vertices of quadrilateral are E (3, 3), U (5, 3), D (1, -1), and P (-1, -1). Sketch the object and represent the coordinates of this quadrilateral under a reflection with respect to the line $y = x$.
3. How is polygon data stored in graphics application
4. Provide the matrix representation for 3D arbitrary fixed point scaling?
5. How to model positive acceleration?
6. Is key frame systems advantageous than parameterized system? Justify your answer
7. Apply run-length encoding for the following string BBBBHHDDXXXXKKKKWWZZZZ to generate optimal encoding symbols.
8. Calculate the bandwidth required to display a full-motion real-time video of 640 X 480 resolution at a 30-Hz frame with 256 colors?
9. List the services provided by the multimedia object manager to retrieve a multimedia object.
10. State how to generate a Hypermedia report?

PART - B (5 x 16 = 80 Marks)

11. (i) Consider a rectangular window whose lower left corner is at (-3, 1) and upper right corner is at (2, 6). Apply Cohen Sutherland line clipping algorithm and find the region codes for the points A(-4,2), B(-1,7), C(-1, 5), D(3,8) E(-2,3), F(1,2), G(1,-2) and H(3,3) Find whether the line segments AB, CD, EF and GH require clipping or not. (8)
- (ii) Apply a rotation by 45° to the rectangle whose vertices are given as A [10, 10], B [10,25], C [45, 25], D [45, 10] and then scale it by $S_x=2$ and $S_y=1.5$ (8)
- 12.a.(i) Derive the continuity property of splines. Also explain how to construct splines using Hermite Interpolation? (8)
- (ii) Illustrate how to rotate an object if the axis of rotation is not parallel to the coordinate

axis. (8)

OR

12.b.(i) Generate perspective projection matrix with projection reference point that is not on the z_v axis. (8)

(ii) How to find the depth of one plane of a polygon using Z-buffer algorithm? Give its drawback. (8)

13.a.(i) Write an OpenGL program to display a 3D wired pyramid with different color for each sides and to rotate the same with an angle 60 degree in counter clockwise. (8)

(ii) Describe the color models HSV and HLS. (8)

OR

13.b.(i) Write the code to draw a 3D cube with perspective projections in Open GL. (8)

(ii) How do you implement morphing animation technique? And show how to generate a cube from square. (8)

14.a.(i) Define MIDI. List its attributes and explain. (8)

(ii) Compare and contrast the use of MIDI and digitized audio in multimedia production. (8)

OR

14.b.(i) Narrate the steps involved in image preparation used in JPEG image compression. Explain with necessary diagrams. (8)

(ii) Information to be transmitted over the internet contains the following characters with their associated frequencies: (8)

Character	A	E	I	O	U
Frequency	45	55	13	22	18

Find the optimal encoding of the symbols to achieve the minimum transmission rate (bits/symbol)

15.a. (i) Explain how X.500 Directory System Standards help users to exchange e-mail and locate users through distributed directory structure. (8)

(ii) Chart the navigation through an application for editing a hypermedia mail message. Also identify the menus required for this application. (8)

OR

15.b.(i) Discuss the design approaches that are available to optimize Object storage. (8)

(ii) Explain time based and object oriented multimedia authoring tool. (8)