B.Sc. (Hons.) Computer Science Semester (VI)

Special Assignment in lieu of End Term Practical Examination

Paper Name: Computer Graphics

Paper Code: 32341602

June 2020   **SET – B**

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NOTE: (i) All Questions are **compulsory**

(ii) Students can use any programming language for Q1, preferably C Language

(iii) Kindly go through the Practical Guidelines for detailed submission requisites.

(iv) +1 mark for accurately following submission guidelines

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Q1. Design and Render a scene to showcase a moving FISH. The Fish should move left, right, front and back on Keyboard control events.   (8+7=15)

To accomplish this, you must perform the following basic tasks:

(a) Design the parts in terms of suitable generic shapes and deformations and draw them using OpenGL.

(b) Design and implement a set of functions that will control the animation.

(c) You should also design the background scene, which will fetch you extra marks.

(d) The amount of extra credit given will depend on the difficultly of the task and the quality of your implementation. In addition, feel free to suggest your own extra credit ideas which you have implemented.

(e) It is suggested that you record the animation along with the self-voice explanation, so that your efforts are well exhibited.

Q2. Use Pseudocode to describe the steps that are required to plot a line whose slope is between 45^0 and -45^0 (i.e $|m| > 1$) using the slope intercept equation.   (2)

Q3. A cubic curve is defined by the points $(1, 1), (2, 3), (4, 4)$ and $(6, 1)$. Calculate the coordinates of parametric midpoint of the curve and verify that its gradient dy/dx is 1/7 at this point.

Sketch the curve.   (3)

Q4. Let $ax+by+cz+d=0$ be the projection plane (p, q, r) be the direction of projection, (x_0, y_0, z_0) be a point on the object to be projected. Then derive its transformation matrix to get the new coordinates after projection. (3)

Q5. Answer the following viva-based questions: (2)

(a) What rendering technique handles reflections and refractions well?
(b) What is the OpenGL name for a potential pixel?
(c) What feature in OpenGL is used to display the closest object when several objects overlap the same pixel?
(d) What's the 2-word name for the technique for storing the graphics on the graphics card (if there's space) so that it does not have to be repeatedly sent down the network each time the window is redisplayed?