

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: BTech in CS. with spl. in Graphics and Gaming Semester – Vth
Subject (Course): Web Programming for Graphics and Gaming (HTML5 and WebGL) Max. Marks

: 100
Course Code : CSEG338 Duration : 3 Hrs
No. of page/s: 2

There are three Sections (Section A, Section B and Section C) in the Question Paper.

1. Section A has Five (05) questions of 4 marks each.
2. Section B has Four (4) Questions of 10 marks each.
3. Section C has Two (2) Questions of 20 marks each.

Section A

Question 1: Is WebGL application compilation free? Support your answer with justification.

Question 2: What is the difference between software based rendering and hardware based rendering?

Question 3: Specify True or False

- i. WebGL is a state Machine
- ii. The parallel running copies of vertex shader receive different set of attributes.
- iii. WebGL don't have inbuilt camera API.
- iv. Attribute type storage cannot be defined inside fragment shader.

Question 4: How Bezier curve can be created in JavaScript canvas?

Question 5: Write the JavaScript method for clearing web storage in HTML5?

Section B

Question 6: In comparison to OpenGL what are the advantages that WebGL offers?

Question 7: Describe briefly the parameters of the API `vertexAttribPointer()` ?

Question 8: Mention any 10 basic types provided by ESSL language not available in standard C library?

Question 9: Explain the working of vertex shader and fragment shader with the help of corresponding code?

Section C

Question 10: Specify all the typical steps (with API call) required for creating and linking Shader code for a WebGL application

OR

How 3-D viewing is implemented in WebGL? Explain all the five transformations that apply to object coordinates for obtaining viewport coordinates?

Question 11: How animation can be performed in a HTML5 canvas. Write the corresponding example code?



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Section A

Question 1: Describe briefly storage specifiers in OpenGL SL used in WebGL application.

Question 2: What is the difference between server based rendering and client based rendering?

Question 3: Write the full form of the following

- i. VBO
- ii. IBO
- iii. OpenGL SL
- iv. OpenGL ESSL

Question 4: Write the JavaScript method for getting WebGL context?

Question 5: Write the canvas method describing its parameters for creating a Bezier curve?

Section B

Question 6: In comparison to other technologies (Java 3D, Flash and the Unity web player plugin), what are the different advantages that WebGL offers?

Question 7: How below operators and functions provided by ESSL works for vectors and matrix.

- i. /
- ii. *
- iii. dot()

- iv. `Cross()` v. `matrixCompMult()`

Question 8: How vertex data is passed from vertex shader to fragment shader with the help of corresponding javascript embedded shader code?

Question 9: Draw and explain WebGL's rendering pipeline?

Section C

Question 10: If `drawArrays()` API is called for vertices A(-0.5, -0.5), B(0, -0.5), C(-0.75, -0.5), D(-0.25, 0.5) and E(0.5, 0.5), how the resultant figure will look like for below five modes

- i. `GL_POINTS` ii. `GL_LINES` iii. `GL_TRIANGLES`
- iv. `GL_LINE_LOOP` v. `GL_LINE_STRIP`

Draw the diagram only neatly with evenly spaced grid as well?

Note: If you are taking any assumptions mention them in the start.

OR

Considering the online available `glMatrix` library for WebGL, describe any five different operations that can be performed with it?

Question 11: Describe the JavaScript canvas methods for performing translation, rotation and scaling?

