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MAIN EXAMINATION

AUGUST - DECEMBER 2015 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

REGULAR PROGRAMME

CMT 404: COMPUTER GRAPHICS

Date: DECEMBER 2015	**Duration: 2 Hours**
INSTRUCTIONS: Answer Question ONE and ANY other TWO Questions	

Q1. a) Explain the meaning of computer graphics according to Wiliam A. **(4 marks)**

b) Define the following terms
- i Specular highlights
- ii Texture mapping
- iii Bomp mapping
- iv Frame buffer
- v Rendering **(10 marks)**

c) List down the methods and properties that can be used to draw a line in canvas. **(2 marks)**

d) Briefly discuss the THREE stages of graphics pipeline. **(6 marks)**

e) Give FOUR advantages of using SVG over other image formats (like JPEG & GIF) **(4 marks)**

f) Write a jQuery javascript code to toggle the appearance of a element over 1 second when a button whose id is #go is clicked. **(4 marks)**

Q2. a) Discuss the parameters / data needed to draw the shapes below on a canvas.

i Quadratic curve
ii Bezier curve
iii Canvas Arc **(6 marks)**

b) Write the javascript that will draw the shapes above using your parameter values on the same canvas. **(14 marks)**

Q3. a) Explain and give example in each case the use of the following SVG elements

i <defs> **(2 marks)**
ii < ! [CDATA […]] >): **(2 marks)**
ii <symbol> **(2 marks)**

b) Mathematics is at the heart of computer graphics. Discuss. **(4 marks)**

c) Obtain the matrix product of the two matrices below

$$\begin{pmatrix} 4 & 8 & 3 & 7 \\ 6 & -3 & 4 & 3 \end{pmatrix} * \begin{bmatrix} 6 & 6 \\ -11 & 3 \\ 5 & -17 \\ 5 & 6 \end{bmatrix} = \begin{bmatrix} - & - \\ - & - \end{bmatrix} = \begin{bmatrix} - & - \\ - & - \end{bmatrix}$$

(4 marks)

d) Discuss THRE types of reflections. **(6 marks)**

Q4. a) Explain how bump mapping is achieved. **(3 marks)**

b) Use an example to illustrate how you can create a shadow in canvas. **(5 marks)**

c) Discuss the use of the following svg tags used in animation. Give an example in each

i <animate>
ii <animatetransform>
iii <animatemotion> **(12 marks)**

Q5. a) Explain the significance of the following concepts as they apply to computer graphics

i Opacity
ii Canvas Composition roles
iii SVG <path> element **(6 marks)**

b) Explain any FOUR animation time properties that can be used in a SVG animation. **(4 marks)**

c) Discuss how computer graphics has impacted the society. **(5 marks)**

d) You are given the html and css code below

```
< ! doctype html>
<html long = “en” >
<head >
<meta charset = “utf – 8” >
<title > animate demo < ? title>
<style >
# #
# bloc {position: relative; background-colour: #abc; width: 40px; height:
80px; float: left; margin: 5xp; display: none}
< / style >
< script src = “jquery -1.10.2js” >< / script>
< / head >
<body>
< button id =” go” > Run >> < /button ><br><br><br>
<div id = “bbc” >< p> ok < / p>< / div >< br>
```

Write the javascript jquery code that will animate div element by taggling the height and opacity for 2 seconds after the button is clicked. **(5 marks)**

END