NATIONAL OPEN UNIVERSITY OF NIGERIA
University Village, 91 Cadastral Zone, Nnamdi Azikwe Expressway, Jabi, Abuja
FACULTY OF SCIENCES
APRIL, 2019 EXAMINATIONS

Course Code: CIT 771
Course Title: Introduction to Computer Graphics and Animation
Credit: 3 units
Time allowed: 2 ½ hours
Instruction: Answer questions ONE (1) and any other FOUR (4) questions

QUESTIONS

1 a) i) Name the application areas of computer graphics. (2 marks)

ii) Draw a typical or generic graphic system. (3 marks)

iii) Write extensively on GPU and its various types. (8 marks)

b) i) What is BRDF? (1 marks)

ii) Explain the classes of BRDFs (4 marks)

iii) Mention the features of BRDF models (2 marks)

c) What is facial modeling? (2 marks)

2 a) Identify and name the properties of Cross products and Dot products of vector. (6 marks)

b) For each of the following, calculate the coordinates. Indicate whether the result is a point or a vector.

i) $v + u$, where $v = (-1, 0, 5)$ and $u = (2, 1, 1)$ (2 marks)

ii) $P + v$, where $P = (1, 2, 3)$ and $v = (-1, -2, -3)$ (2 marks)

iii) $P - Q$, where $P = (5, 5, 5)$ and $Q = (1, 2, 3)$ (2 marks)

3a) For each of the following, calculate sv and $|sv|$ when

i) $s = 3$, $v = (1, 1, 1)$ (3 marks)

ii) $s = 0.25$, $v = (-4, 8, 2)$ (3 marks)

b) Calculate the dot product of the following. What does the result tell you about the angle between the vectors?

i) v = (1, 0, 0) and u = (0, 1, 0) (2 marks)

ii) v = (1, 1, -1) and u = (2, 1, 0) (2 marks)

iii) v = (-2, 0, 0) and u = (1, 1, 1) (2 marks)

4 a) i) Briefly explain alpha compositing (2 marks)

ii) Mention the three main types of optical illusion with concrete examples (6 marks)

b) i) What are the purposes of transformation in computer graphics? (2 marks)

ii) Explain Shadow mapping and how they are created (2 marks)

5a) Explain the Thin Lens Camera Model. (2 marks)

b) i) What do you understand by a pinhole camera model? (3 marks)

ii) Name application areas of the pinhole camera model (2 marks)

c) Briefly explain two important properties of perspective projections (2 marks)

d) i) Explain your understanding of the term Rasterization? (3 marks)

6 a) Discuss the uses of Z-buffering (4 marks)

b) Write the Z-buffering algorithm (4 marks)

c) State two advantages and disadvantages each of hierarchies (4 marks)