



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)