FAMILY NAME:_____   GIVEN NAMES: _____

STUDENT ID: | | | | | | | | | SIGNATURE:_____

This Paper Contains: **4** pages **(including title page)**
Time allowed: **40 Minutes**

This is not a graded test. Due to online teaching mode, this test will not contribute to your final grade. It is provided for your self-assessment only. No submission is required. The pattern and format is kept consistent with the exams of previous years, only for the usual experience. You may choose to ignore the NOTE below. The sample solution will be uploaded soon. You may like to mark your answers for self-assessment in the light of the sample solution.

INSTRUCTIONS:

Write your names and student numbers on this page.

There are 3 questions in total. Question 1 and 3 have subparts. Each question, including any subparts, carries 10 marks. Answer all questions. Write your answers on this sheet in the space provided after each question.

Calculators, notes and books are not allowed.

Total marks are 30.

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Question 1-(a)   [2 marks]
What do you understand by the terms 'luminance image' and 'colour image'? Differentiate
between the two by describing the key properties of the two.

Question 1-(b)   [2 marks]
Name four primitives and four attributes in OpenGL.

Question 1-(c)   [5 marks]
Write the names of the three main elements of image formation [3 marks] and explain
briefly [2 marks] why it is beneficial for these elements to be independent of each other.

Question 1-(d)   [1 mark]
What is the dimensions and type of the data expected by the function 'glUniform3f'?

Question 2.   [10 marks]
Draw a diagram [2 marks] showing the four main blocks of the OpenGL pipeline
architecture. Briefly explain the functionality of each block [2 marks each].

Question 3-(a) [4 marks]
OpenGL chooses to only display triangles because of their three desirable properties. What are those properties? [3 marks]. How polygons other than triangles would be treated by OpenGL?

Question 3-(b) [2 marks]
What are the applications of vertex shader i.e. what operations can be performed at the vertex shader. Write any two.

Question 3-(c) [4 marks].
Name four standard transformations? [2 marks] For M1= ABCD and M2 = DCBA, is it true in general that M1 = M2? - provided that A, B, C and D are standard transformations. [2 marks]

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