Brunel UNIVERSITY LONDON

School of Engineering and Design

SED06: Examinations Cover Sheet

SUBJECT AREA: ECE

Module Code: EE5565

Module Title: 3D Film Design and production

Date-Month: MAY **Year: 2012**

Time allowed – 2 Hours:

All students must answer all questions.

Only School approved calculators are allowed.

Examiner(s): Dr Amar Aggoun and Dr Angelina Karpovich

Special Stationery Requirements: None

Answer All Questions.

1. With the aid of a diagram, explain what is meant by the terms "convergence", "accommodation" and "Horopter" with respect to the Human vision.

[5 marks]

2. Describe four monocular depth perception cues.

[5 marks]

3. "Active" and "Passive" 3D stereo are two techniques for visualising 3D data in stereo. Explain in some detail the process of each technique.

[5 marks]

4.

a) With the aid of diagrams, describe two technologies that are used for auto-stereoscopic 3D displays.

[5 marks]

b) State at least one advantage and one disadvantage of each technology of part a) and compare the technologies.

[3 marks]

c) Auto-stereoscopic 3D displays, used for the display of multiview stereo images, suffer from what is known as Moiré effect. Describe one solution being used in commercially available auto-stereoscopic display systems.

[7 marks]

5. Viewers looking at stereoscopic displays without the appropriate goggles will see two superimposed images that appear to be out of alignment. This effect makes the objects appear to be displaced horizontally to a greater or lesser degree. This displacement of the images between the left and right eye is known as "parallax".

(i) Explain the terms positive parallax and negative parallax.

[4 marks]

(ii) With the aid of a diagram, provide the possible zones of screen parallax.

[6 marks]

(iii) The convergence point determines where the object appears in relation to the screen. Describe two possible methods used to adjust convergence. Explain the advantages and disadvantages of each setup.

[7 marks]

(iv) Describe two possible stereo 3D camera rigs. Explain the advantages and disadvantages of each setup.

[5 marks]

(v) Describe the effects of adjusting the interaxial.

[3 marks]

(vi) Describe the meaning of the term "depth budget" in stereo production.

[3 marks]

(vii) Describe the main drawbacks associated with stereo imaging in general. Explain the severity of these drawbacks for both home and cinema theatres.

[7 marks]

(viii) "Edge violation" is one the errors associated with stereo 3D production. Describe the meaning of "edge violation" and a technique used in post production to fix this error.

[5 marks]

6. "Holography" and "Integral Imaging" are two 3D imaging technologies that resolve the problems associated with stereo imaging. Explain in some detail how they are used to capture and display 3D images.

[10 marks]

[END OF EXAM PAPER]