

UNIVERSITY OF LONDON
(University College London)

B.A. DEGREE; [B.S.C.](#) DEGREE; B.SC. (ECON) DEGREE; B.ENG. DEGREE 2001

COMPUTER SCIENCE B402: INTERNET AND NEW MEDIA

May 2001

Answer THREE Questions. Time 2 hours 30 minutes.

1. Hypertext Markup Language
 - a) Outline the basic format of HTML tags and give an example of a valid web document (i.e. containing at least the mandatory tags).

[9 marks]
 - b) Describe Tables, Forms and Frames, and explain the difference between them, giving an example of the HTML specification for each.

[8 marks]
 - c) Describe how hypertext links are specified in a web page using Anchors, and the statements for inserting images.

[8 marks]
 - d) Explain the concept of Style Sheets. Then describe how a Style Sheet is referenced, and give an example of a number of different Style rules.

[8 marks]

2. Web-based Programming and Data Communications
 - a) Explain the organisation of a Web-programming system such as Dreamweaver, and how it assists you in creating and managing a web site.

[11 marks]
 - b) In 1995, a person who wanted to create Web pages could not avoid being a programmer. What did this person have to program, and what kind of program material had to be written? Give a short and simple example, as part of your answer.

[6 marks]
 - c) A UK fashion retailer wishes to provide a web site allowing its customers to purchase products online. The web site is expected to receive 200 customers per day. Write a brief report outlining the implementation of the web site:
 - i) Taking into account where the web server is located and why.
 - ii) The type of communication links for connecting the server to the Internet and issues such as capacity.

[11 marks]
 - d) A company now has a prototype system for delivery of smells via access to Web pages. Taking into account how audio and video files are handled by the Web, how might "smell delivery" work?

[5 marks]

3. 2D Image Manipulation and Multimedia Authoring
- a) In the context of 2D image creation and manipulation tools (such as Adobe Photoshop):-
- i) What are layers and why are they used?
 - ii) What are 'web-safe' colours and why are they used?
 - iii) Compare and contrast any 2 file formats commonly used to represent and compress 2D digital images?
 - iv) List 10 different things you can do to manipulate digital images with Photoshop.
- [11 marks]
- b) For FLASH describe the facilities it provides for multimedia authoring and its general structure.
- [11 marks]
- c) Compare and contrast the Photoshop and Flash packages, giving examples of the usage of each package.
- [11 marks]
4. 3D Image Manipulation
- a) Describe briefly three technologies for putting 3D content on the web. For each technology give examples of applications for which it is most suitable.
- [12 Marks]
- b) Describe, briefly, the role of the following types of node in describing objects in VRML97:
- i) Appearance
 - ii) Transformation
 - iii) Text
 - iv) Texture
- [12 Marks]
- c) Outline the stages in the process of generating a mesh in a 3D modeller.
- [9 marks]
5. Audio and Video File Content
- a) Explain the process one would need to go through to get video from an analogue source or a digital source to a digital video file suitable for distribution on the web. Include a discussion of types of compression possible and options for editing such material before the final output file is produced.
- [8 marks]
- b) Explain the concepts of video and video displays. Discuss the details of:
- i) Frame rate vs scan rate
 - ii) Human perception of motion in video
 - iii) The levels of quality of video available
 - iv) Two ways of scanning video onto a display
- [9 marks]
- c) Give an overview of the steps an analogue audio signal needs to go through to be converted into a compressed digital form. Describe this process (including details on sampling frequency) and the editing process. Give examples of software that may be used to assist in production of the resulting digital files.
- [8 Marks]

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d) Provide approximate figures for the amount of storage required (in kilo bytes) required to store a 10 second sequence of media at the following qualities:

- i) Conference quality (assuming 128kilo bits per second, and audio at 8000 samples per second, 8 bits per sample)
- ii) Broadcast Quality (assuming 8Mega bits per second, and audio at 44100 samples per second, 16 bits per sample, number of audio channels = 2)

Give examples of a possible compression algorithm used in each case.

[8 marks]

END OF PAPER