



SCHOOL OF MATHEMATICAL AND COMPUTER SCIENCES

Computer Science

F27WD

Web Design and Databases

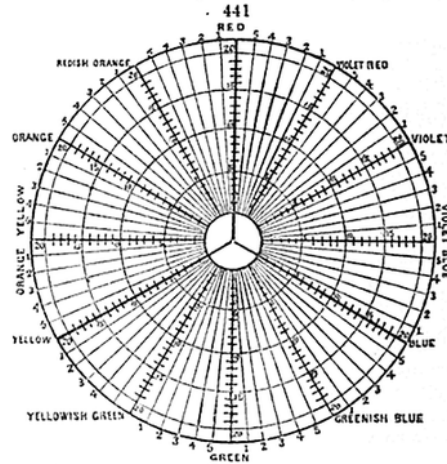
Semester 2 201516

Duration: Two Hours

ANSWER THREE QUESTIONS

- Q1 (a) State what CSS and HTML stand for. (2)
- (b) Consider Chevreul's 1885 colour wheel:

800. Chevreul's classification of colors, and chromatic diagram.—The chromatic diagram, of Chevreul, fig. 441, greatly



facilitates the study of complementary colors, and the modifications produced by their mutual proximity.

The colour names on the wheel above, read from the top in clockwise direction are:

RED (at the top, just under "441"), VIOLET RED, VIOLET, VIOLET BLUE (far right), BLUE, GREENISH BLUE, GREEN (at the bottom), YELLOWISH GREEN, YELLOW, ORANGE YELLOW (far left), ORANGE, and REDISH ORANGE.

- (i) State what Chevreul might recommend you wear with brown shoes: navy jeans or black jeans. Give a detailed and specific explanation of why, in terms of his colour wheel. (2)
 For the purposes of this question, brown = dark orange and navy = dark blue.
- (ii) In the film "The Dark Knight" the character of the Joker wears a (2)
 • purple jacket (purple = violet blue, for the purposes of this question),
 and
 • reddish orange lipstick.
 Chevreul's colour wheel precisely and accurately predicts the colour of the Joker's hair: state this prediction and give a detailed and specific explanation for it.
- (c) (i) In the context of web design, explain what **breadcrumbs** are and how they are used, giving at least one concrete example. (4)
- (ii) Why are breadcrumbs needed for webpages but not, usually, for physical objects such as buildings, parks, or roads? (2)
- (iii) Give one example of a breadcrumb-like structure that predates the Internet and has nothing to do with computers. (2)
- (d) (i) Explain the term **satisficing**. (2)
- (ii) Write a detailed description on the relevance of satisficing to website design. Note this question is worth four marks, so your answer should include four clear, distinct, and pertinent points. (4)

Q2

- (a) (i) Explain the point of using CSS instead of, say, just coding everything directly in HTML. Note this question has four marks, so your answer should include four clear, pertinent, and distinct observations. (4)
- (ii) I create a webpage with good CSS including style tags which I call `<boldfont>` and `<italicfont>` (which my CSS says should be displayed in bold font and italic font). I use these on my webpage consistently and correctly *instead of* `` and ``. Give two distinct reasons that this is this poor practice and should be deprecated. (2)
- (iii) Explain the difference between `margin` and `padding`. Give a practical example of how we might see them used in a webpage. (4)
- (b) (i) You see this in some CSS code: (2)

```
.clear { clear: both; }
```


What is this doing?
- (ii) Explain the difference between `id` and `class`. Give one natural example of each. (4)
- (c) The Internet has made the world a larger place. (4)
The Internet has made the world a smaller place.
Discuss.

Q3

The following tables keep track of research projects, the staff working on these projects and the roles they play in the project (pi = principal investigator, ra = research associate, admin = administrator), and the number of hours each person has worked on each project each day.

Staff:

sid	name	role
12	Prof Smith	pi
86	Ken Bond	ra
87	Karen Pitt	ra
99	Mike Elder	admin
195	Prof Conner	pi

ResearchProject:

pid	title	funder	pi
48	Takar	BBSRC	195
149	Tetra	BBSRC	12
199	HelpTak	EPSRC	12

TimeRecords:

pid	sid	workDate	workHours
48	87	2013-02-18	8
48	87	2013-02-19	3
48	195	2013-02-18	2
149	12	2013-02-18	2
149	86	2013-02-18	8
149	86	2013-02-19	8
149	99	2013-02-18	1
199	87	2013-02-19	5
199	99	2013-02-18	2
199	99	2013-02-19	2

- (a) Write an SQL query to answer the following question: (2)
What role does Ken Bond play?
- (b) Write an SQL query to answer the following question: (3)
What are the names of PI's in charge of projects funded by BBSRC?
- (c) Write an SQL query to answer the following question: (3)
How many different PI's are in charge of projects funded by BBSRC?
- (d) Write an SQL query to answer the following question: (6)
What are the names of the PI's of those projects on which somebody was working on on 18th of February 2013?
- (e) Write an SQL query to answer the following question: (6)
Which funders support (fund) more than one project and how many do they fund? (Hint: For the above data set, your query result should show that BBSRC funds 2 projects.)

Q4

(a) Develop an ER diagram (using Chen notation) to capture the following requirements of a library database. (14)

- The library has several branches, each with its own unique address.
- Several branches may have multiple copies of the same book. The number of copies per branch needs to be recorded.
- A book has an ISBN number (unique) and a title.
- Book authors are identified by an author id and have a name.
- An author may have authored multiple books and each book has one or more authors.
- Clients are assigned a unique Library ID and their name and address are to be stored.
- A client may borrow multiple books at any time, for each of which a checkout date has to be recorded for that client.
- A client is registered with only one branch of the library.

(b) You are given the following three transactions:

T1: R1(x) R1(y) W1(x)

T2: R2(x) R2(y)

T3: W3(x) W3(z)

Below is a possible execution schedule S:

S: R1(x), R1(y), R2(x), R2(y), W3(x), W1(x), W3(z)

- (i) What are the conflicting operations in schedule S? (3)
- (ii) Draw the serialization graph for S. (2)
- (iii) Is S a serializable schedule? Briefly explain your answer. (1)

END OF PAPER