THE UNIVERSITY OF AUCKLAND

SECOND SEMESTER, 2008
Campus: City

COMPUTER SCIENCE

Mastering Cyberspace: An Introduction to Practical Computing

(Time Allowed: TWO hours)

NOTE: You must answer **all** questions in this exam.
No calculators are permitted
Answer Section A (Multiple choice questions) on the Teleform answer sheet provided.
Answer Section B in the space provided in this booklet.
There is space at the back for answers that overflow the allotted space.

Surname	**Sample**
Forenames	**Solutions**
Student ID	
Login (UPI)	

	Question	Mark	Out Of
1 - 32	Multiple Choice Questions		40
33	Acronyms		10
34	Spreadsheets		10
35	Programming using Python		10
36	LaTeX		10
37	XHTML and CSS		10
38	Databases		10
	TOTAL		**100**

CONTINUED

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SECTION A

MULTIPLE CHOICE QUESTIONS

Each question in this section is worth 1.25 marks. There is only **one** correct answer for each question. Select your preferred alternative on the Teleform answer sheet provided by shading in the appropriate box.

Question 1
What decimal number is represented by the binary number 00011100?
    A. 56
    (B.) 28
    C. 18
    D. 12
    E. 24

Question 2
How many numbers can be represented using 6 bits?
    A. 6
    (B.) 64
    C. 12
    D. 32
    E. 48

Question 3
Which one of the following devices is classified as an input device?
    A. System Unit
    (B.) Webcam
    C. Screen
    D. USB flash disk
    E. Broadband modem

Question 4
Which one of the following statements is false?
    (A.) The capacity of the motherboard is measured in MB
    B. The CPU and RAM plug directly into the motherboard
    C. Information stored in RAM is lost when the power is switched off
    D. The CPU follows instructions and performs calculations
    E. CPU speed is measured in Hertz while capacity of RAM is measured in Bytes

CONTINUED

Question 5
Which one of the following statements is false?
  A. Microsoft Word uses a graphical user interface, but Microsoft Excel uses a command line interface
  B. Programs are loaded from secondary storage to primary memory before they execute
  C. If an application is created and sold as a proprietary product, then you cannot legally copy that software even if the company has gone out of business and no longer exists
  D. File extensions are used by the operating system to decide how to open the file
  E. Open-source software must include a licence that gives a user the right to copy and modify the software

Question 6
Which one of the following would be classified as system software?
  A. Software that allows a user to send an email
  B. Software that allows a user to create a poster
  C. Software that allows a user to remove a virus
  D. Software that allows a user to write a letter
  E. Software that allows a user to browse the web

Question 7
What is the main purpose of protocols used on the Internet?
  A. To ensure that two systems can communicate through a network, even when part of that network is destroyed
  B. To have a standard way to communicate between two systems
  C. To prevent errors from occurring in the data transmission process
  D. To increase the reliability of packet-switching networks
  E. To speed up the transfer of data between two systems

Question 8
Which one of the following statements is false?
  A. A domain name server translates TCP addresses into IP addresses
  B. Ethernet is normally used to transfer information within a local area network
  C. The Internet was originally developed by the US Department of Defense
  D. New Zealand has been connected to the Internet for approximately half the time it has existed
  E. For most of the time it has existed, the Internet has grown at an exponential rate

Question 9
Which one of the following means of communication is synchronous?
  A. Discussion via email
  B. Discussion thread on a forum
  C. Discussion page on a wiki
  D. Discussion via chat (instant messaging)
  E. Series of blog posts

CONTINUED

Question 10
Email messages can be sent to addresses that appear in any of three fields: TO, CC and BCC.
Which one of the following statements about the fields is true?
    A. Recipients in the TO field can see the addresses that are in the other two fields
    B. Recipients in the CC field can see the addresses that are in the other two fields
    C. Only recipients in the BCC field can see the other addresses in the BCC field
    D. Only recipients in the CC field can see the other addresses in the CC field
    (E.) Recipients in the BCC field can see the addresses that are in the other two fields

Question 11
Which one of the following statements is false?
    A. A forum moderator is able to edit and delete messages posted to that forum
    (B.) POP3 is a protocol used to send and receive mail
    C. SMTP is a protocol used to send mail
    D. Any type of file can be sent as an email attachment including viruses
    E. IMAP is a protocol used to receive mail

Question 12
Which one of the following statements is true?
    A. You can trust the material on a blog because the community is self-moderating
    B. A blog is an online tool that is used to create websites
    C. Wikis are normally moderated by an editor
    D. You should never edit information that someone else has written on a wiki
    (E.) A blog is a web site containing posts that are listed in order of date and time

Question 13
Which one of the following does NOT have the events in the correct chronological order?
    A. TCP/IP was developed at Stanford University
       The Domain Name System was introduced
       Firefox was created
    B. ARPANET was created
       New Zealand connected to the Internet
       The WWW was released to the public
    C. ARPANET was created
       Tim Berners-Lee started the WWW project
       Firefox was created
    (D.) New Zealand connected to the Internet
       TCP/IP was developed at Stanford University
       Internet Explorer was created
    E. The Domain Name System was introduced
       New Zealand connected to the Internet
       Internet Explorer was created

CONTINUED

Question 14

Which one of the following statements is true?
    A. A proxy searches the Internet for you and suggests links that might be of interest
    B. Tim Berners-Lee created the first computer hypertext system
    C. Hypertext consists of many different forms of media with links between them
    (D.) Ted Nelson created the first computer hypertext system
    E. Vannevar Bush created the first computer hypertext system

Question 15

What word is represented by the ASCII codes: 70 97 99 101?
    A. Fade
    B. FACE
    (C.) Face
    D. FADE
    E. fade

Question 16

Which one of the following is not an advantage of styles in MS Word?
    A. It is easier to change the appearance of the document by changing the style definition rather than making changes to multiple locations.
    B. Styles can be given names that make it easy to remember what the style is used for (e.g. Title, Footnote, Heading1)
    (C.) Formats citations according to the style required by your discipline (e.g. APA, Harvard)
    D. Improves the consistency of the document by applying the same formatting to structurally similar elements
    E. It speeds up formatting by applying many changes simultaneously

Question 17

How much memory is required to represent an image that is 4 pixels wide and 4 pixels high and uses 4 colours?
    A. 12 bits
    B. 4 bits
    C. 64 bits
    (D.) 32 bits
    E. 16 bits

Question 18

Which one of the following statements about image formats is false?
    A. SVG is good for diagrams, but it can only be used with vector graphics
    B. GIF is a lossless method that is good for diagrams, but can only represent a limited number of colours
    C. Vector graphics can be scaled to any size without loss in quality, but bitmaps lose quality when they are scaled up.
    (D.) PNG is a lossy method that is good for diagrams, but it can also be used for photographs
    E. JPEG is a lossy method that is good for photographs, but not as good for diagrams

Question 19

Which one of the following statements is false?
  A. Turing's view is consistent with "weak AI", while Searle's view is consistent with "strong AI"
  B. Turing reasoned that behaviour is all that matters and that if something behaves intelligently then it is intelligent
  C. Weak AI is the view that computers could not become self-aware, but could solve problems in well-defined domains
  D. Strong AI is the view that computers could become self-aware and exhibit intelligent behaviour
  E. Searle reasoned that behaviour is not all that matters and that you have to look at the internal process to determine whether or not something is intelligent

Question 20

Which one of the following statements is false?
  A. Humans use computer expert systems to help make medical diagnoses
  B. Computers can equal or surpass humans at some tasks that require reasoning, such as playing chess
  C. Complex behaviours such as the flocking behaviour of birds can emerge from a system in which each entity follows a set of very simple rules
  D. Autonomous agents are designed to operate independently in a defined environment and can typically adapt to problems, create a plan and enact that plan without human intervention
  E. The problem of combinatorial explosion has been solved by Moore's Law

Question 21

Which one of the following statements is true?
  A. The Tabulating Machine Company created by Herman Hollerith eventually became IBM
  B. Gordon Moore and Thomas Watson Jr. started Intel Corporation
  C. Microsoft founder Bill Gates visited Xerox Parc and was inspired to create Windows
  D. Steve Jobs and Steve Wozniak created Apple computers because they needed a machine that would run VISICALC
  E. Macintosh founder John Warnock created the Laser Printer

CONTINUED

Question 22

Which one of the following does NOT have the events in the correct chronological order?
  A. Altair 8800 created
     VISICALC released
     Apple founded
     Macintosh created
     Windows 3.0 released
  B. IBM founded
     Intel founded
     Microsoft founded
     VISICALC released
     Macintosh created
  C. IBM founded
     Altair 8800 created
     VISICALC released
     IBM PC released
     Macintosh created
  D. Intel founded
     Altair 8800 created
     IBM PC released
     Macintosh created
     Windows 3.0 released
  E. Intel founded
     Microsoft founded
     Apple founded
     IBM PC released
     Windows 3.0 released

Question 23

Which one of the following statements is false?
  A. IBM created the BIOS chip for their PC released in 1981
  B. The Altair 8800 was a kitset computer based on the Intel 8080 chip
  C. Compaq legally reverse-engineered the BIOS chip to make a fully compatible PC
     clone
  D. Laser printers were originally developed at Xerox Parc
  E. Microsoft began as a company that wrote operating systems, and later started writing
     compilers and other applications.

Question 24

Who were the founders of Microsoft?
  A. Bill Gates and Gordon Moore
  B. Bill Gates and Robert Noyce
  C. Bill Gates and Steve Jobs
  D. Bill Gates and John Warnock
  E. Bill Gates and Paul Allen

CONTINUED

Question 25

Which one of the following statements is false?
    A. Information that is legal to view, and legal to host on a web site in one country might be illegal to view in another, even though it is easily accessible. This makes it difficult to control "dangerous" material available on the Internet.
    B. It is difficult to apply censorship laws in NZ to the Internet because information accessed by citizens within NZ enters the country without passing through customs, so information is not assessed by an official.
    C. Censorship laws in NZ are not legally applicable to the Internet because it is not one of the media types listed under the Films, Videos, and Publications Act (1993). This is one area where laws have failed to keep up with developments in technology.
    D. Netsafe recommends that parents have the computer in the lounge or other public location so that they can monitor what their children are viewing on the Internet.
    E. It is difficult to apply censorship laws in NZ to the Internet because information is accessed within the privacy of a person's home so it is difficult to monitor the information that is viewed.

Question 26

Which one of the following statements about blocking software is false?
    A. A white list prevents access to a number of web sites that are harmless.
    B. A white list prevents access to every site that is not on the list.
    C. A white list allows access to a number of web sites that are harmful.
    D. A black list allows access to a number of web sites that are harmful.
    E. A black list prevents access to every site that is on the list.

Question 27

Which one of the following statements is true?
    A. A virus cannot be transferred through email attachments
    B. A worm is a program that makes copies of itself and replicates through a network
    C. A trojan is a kind of virus that hides by disguising itself as another program
    D. A virus can damage LCD monitors
    E. A logic bomb is an error in a program that is accidentally left in by a programmer

Question 28

Which of the following is not a valid command in the ADO.NET Data Provider to perform actions on the data source?
    A. select
    B. insert
    C. delete
    D. update
    E. edit

CONTINUED

Question 29

A Web form can display in _____.
i) a browser
ii) a notepad
iii) Internet Explorer
iv) Microsoft Office Access 2007
    A. i, ii, iii and iv
    B. ii and iii
    C. i and iii
    D. ii only
    E. i only

Question 30

Which is NOT one of the view options provided by Microsoft Office PowerPoint 2007 to look at and modify your presentation?
    A. Slide Show
    B. Notes Page
    C. Design View
    D. Slide Master
    E. Normal

Question 31

The menu command used to begin a PowerPoint presentation in Microsoft Office PowerPoint 2007 is
    A. Insert/Slide.
    B. Play/Play Slide.
    C. Format/Slide Show.
    D. View/Slide Show.
    E. Format/Slide.

Question 32

Which view is the default view that will display immediately when the PowerPoint program is started?
    A. The task pane.
    B. The Slide Sorter view.
    C. The Normal view.
    D. The Slide Show view.
    E. The Handout master view.

SECTION B

Answer all questions in this section in the space provided. If you run out of space, then please use the overflow sheet at the back of this booklet, and indicate in the allotted space that you have used the overflow sheet.

33.   Acronyms (10 marks)

(a) What does ROM stand for?

Read Only Memory

(1 mark)

(b) What does HDD stand for?

Hard Disk Drive

(1 mark)

(c) What does PNG stand for?

Portable Network Graphics

(1 mark)

(d) What does ISP stand for?

Internet Service Provider

(1 mark)

(e) What does WYSIWYG stand for?

What You See Is What You Get

(1 mark)

(f) What does SVG stand for?

Scalable Vector Graphics

(1 mark)

(g) What does TCP/IP stand for?

Transmission Control Protocol / Internet Protocol

(1 mark)

(h) What does DBMS stand for?

Database Management System

(1 mark)

(i) What does QBE stand for?

Query By Example

(1 mark)

(j) What does SQL stand for?

Structured Query Language

(1 mark)

CONTINUED

ID..…………………….

34. Spreadsheets (10 marks)

Given the following spreadsheet about students' information:

	A	B	C	D	E	F
1	**ID**	**UPI**	**FirstName**	**Surname**		
2	19944	jhod9001	Jacob	Hodson		
3	30311	msmi9032	Michael	Smith		
4	46533	jlee9012	Joshua	Lee		
5	76986	mwen9003	Matthew	Weng		
6	80052	epar9008	Ethan	Park		
7	81206	adav9017	Andrew	Davis		
8	88726	dden9011	Daniel	Denden		
9	95234	whun9034	William	Hung		
10	97374	jfon9002	Joseph	Fong		

We would like to calculate the grade of the following students.

	A	B	C	D	E	F
12		**Weighting**	0.50	0.50		
13	**ID**	**FirstName**	**Test**	**Exam**	**Final**	**Passed?**
14	30311	Michael	95	80	87.5	YES
15	76986	Matthew	60	35	47.5	NO
16	81206	Andrew	75	70	72.5	YES
17			76.666667	61.66667		

(a) What is the best formula to use in Cell B14, assuming you want this formula to fill down from B14 to B16 correctly? (Note: You will need to use a VLOOKUP function to look up the student's first name in the table on the top of the spreadsheet.)

= VLOOKUP (A14, $A$2:$D$10, 3, FALSE)

(4 marks)

(b) What is the best formula to use in Cell C17 to calculate the average mark of the test?

= AVERAGE (C14:16)

(1 mark)

CONTINUED

(c) What is the best formula to use in Cell E14, assuming you want this formula to fill down from E14 to E16 correctly? (Note: the weighting of the test and exam are given in Cell C12 and D12 respectively. The total for each assessment (test/exam) is multiplied by the weighting. Then, the weighted totals are added together for the Final mark.)

```
= C14 * $C$12 + D14 * $D$2
```

(2 marks)

(d) What is the best formula to use in Cell F14, assuming you want this formula to fill down from F14 to F16 correctly? (Note: the passing mark is 50.)

```
= IF (E14 >= 50, "YES", "NO")
```

(3 marks)

CONTINUED

ID..…………………….

35. Programming using Python (10 marks)

(a) Write a program that asks the user to enter a choice from a menu. The program
should then print out the price of the item chosen by the user. The prices are as
follows: Pizza $6, Pasta $4, Soup $9.

Your program should produce the exact output shown below. The example given
below is when the user enters 1 at the prompt.

Hint: You should use an if statement.

```
1. Pizza
2. Pasta
3. Soup
Please enter your choice: 1
The price of Pizza is $6
```

```
print "1. Pizza"
print "2. Pasta"
print "3. Soup"

choice = input("Please enter your choice: ")

if choice == 1:
    print "The price of Pizza is $6"

if choice == 2:
    print "The price of Pasta is $4"

if choice == 3:
    print "The price of Soup is $9"
```

(5 marks)

CONTINUED

(b) What is the output of the following code?

```
count = 4
end = 6
sum = 0;
print count
while count < end:
    count = count + 1
    sum = sum + count
    print count, ":", sum
print count
```

```
4
5 : 5
6 : 11
6
```

(5 marks)

ID...…………………….

36. LaTeX (10 marks)

Write the LaTeX code that will produce the following output:

<div style="border:1px solid;">

Statistics

Andrew Luxton-Reilly

Oct 6, 2008

1 Independent two-sample t-test

Statistical formulae depend on many things, such as:

- Sample size
- Variance

1.1 Equal sample sizes, equal variance

One formula is:

$$S_{X1X2} = \sqrt{\frac{S_{X1}^2 + S_{X2}^2}{2}}$$

</div>

The following commands have been included as a reference. You will not need to use all of these commands. Note that the basic document structure has been completed for you.

Normal commands	Environments	Math mode commands
\emph{}	itemize	\sum_{}^{}
\section{}	enumerate	\frac{}{}
\subsection{}	verbatim	\sqrt{}
\large	flushright	\pi
\textbf{}	center	
\item	quote	^
\title{}	displaymath	
\author{}	equation	_
\date{}		
\maketitle		

```
\documentclass[a4paper]{article}
\begin{document}
\title{Statistics}
\author{Andrew Luxton-Reilly}
\date{Oct 6, 2008}
```

ID..…………………….

```
\maketitle
\section{Independent two-sample t-test}
Statistical formulae depend on many things, such as:
\begin{itemize}
    \item Sample size
    \item Variance
\end{itemize}
\subsection{Equal sample sizes, equal variance}
One formula is:
\begin{displaymath}
S_{X1X2} = \sqrt{\frac{S_{X1}^{2} + S_{X2}^{2}} {2}}
\end{displaymath}
```
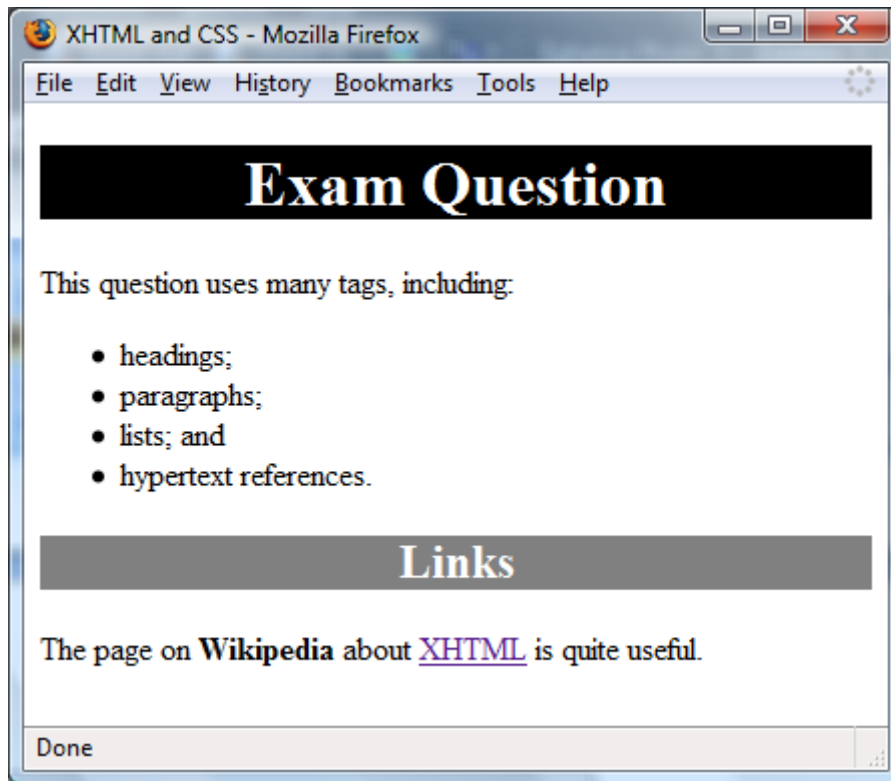
```
\end{document}
```

(10 marks)

CONTINUED

37. XHTML and CSS (10 marks)

The following screenshot shows a web page created using XHTML 1.0 strict and Cascading Style Sheets:

Write the style sheet located in the file `theme.css` and complete the XHTML source code that uses the style sheet to create the page shown in the screenshot above. Note that the heading "Exam Question" is the largest size heading and has a black background, while the heading "Links" is the second-largest heading and has a gray background. The following properties and values might be useful to you. Note that you do not need to use all the properties in the CSS.

font-size	xx-small, x-small, small, medium, large, x-large, xx-large, *length (e.g. 24pt)*
font-style	normal, italic
font-variant	normal, small-caps
font-weight	normal, bold
color	aqua, black, blue, fuchsia, gray, green, lime, maroon, navy, olive, orange, purple, red, silver, teal, white, and yellow
background-color	
border-color	
text-indent	*length (e.g. 24pt)*
text-align	left, right, center, justify
border-style	none, hidden, dotted, dashed, solid, double, groove, ridge, inset, outset
border-width	*length (e.g. 24pt)*

CONTINUED

(a)   Write the style sheet (`theme.css`):

```css
h1,h2 {color:white; text-align:center;}

h1 {background-color:black;}

h2 {background-color:gray;}

.important {font-weight:bold;}
```

(5 marks)

(b)   Complete the XHTML code that uses `theme.css` to create the page shown in the previous screenshot. Note that the hypertext reference links to the page at http://en.wikipedia.org/wiki/Xhtml.

```html
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE html PUBLIC"-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">

<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
<head>
<title>XHTML and CSS</title>
<link rel="stylesheet" href="theme.css" type="text/css"></link>
</head>
<body>

<h1>Exam Question</h1>
<p>This question uses many tags, including:</p>
<ul>
    <li>headings;</li>
    <li>paragraphs;</li>
    <li>lists; and</li>
    <li>hypertext references</li>
</ul>
<h2>Links</h2>
<p>
The page on <span class = "important">Wikipedia</span> about
 <a href="http://en.wikipedia.org/wiki/xhtml">XHTML</a> is
 quite useful.
</p>
```
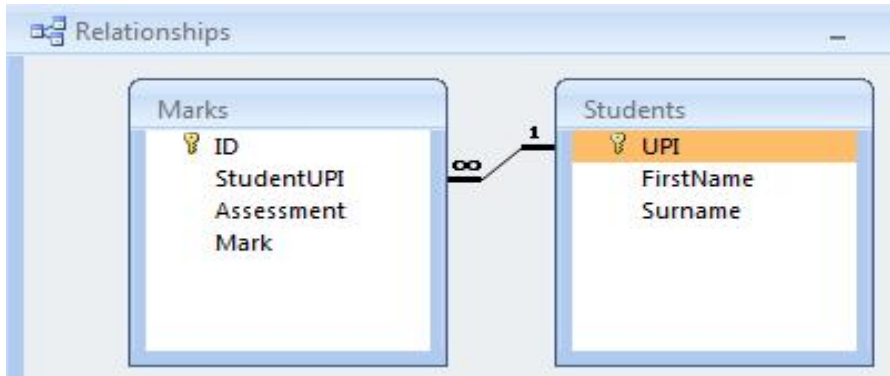
CONTINUED

ID..…………………….

```
</body>
</html>
```

(5 marks)

CONTINUED

38. Databases (10 marks)

The following Relationship diagram and tables are to be used for all parts of this question.

Students		
UPI	FirstName	Surname
adav9017	Andrew	Davis
ccam9005	Christopher	Cameron
dden9011	Daniel	Denden
epar9008	Ethan	Park
jfon9002	Joseph	Fong
jhod9001	Jacob	Hodson
jlee9012	Joshua	Lee
msmi9032	Michael	Smith
mwen9003	Matthew	Weng
whun9034	William	Hung

Marks			
ID	StudentUPI	Assessment	Mark
1	msmi9032	Test	95
2	mwen9003	Test	60
3	adav9017	Test	75
4	msmi9032	Exam	80
5	mwen9003	Exam	35
6	adav9017	Exam	70

(a) What is the primary key of the Students table?

UPI

(1 mark)

(b) What is the primary key of the Marks table?

ID

(1 mark)

CONTINUED

(c) Given the relationship diagram shown on the previous page, what is the foreign key of the Marks table?

StudentUPI

(1 mark)

(d) Can you add the following student to the Students table? Why?

UPI: adav9020, Andrew Davis

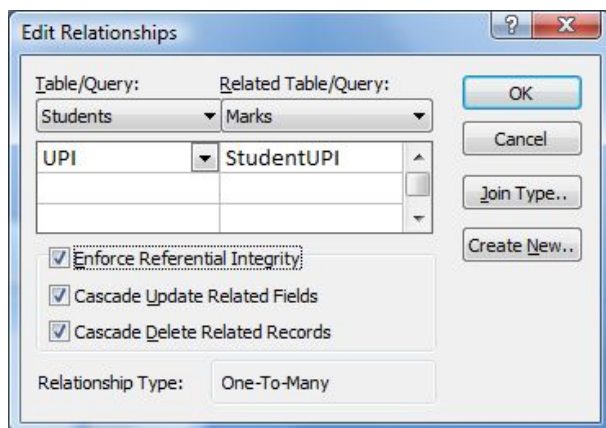Yes. There is currently no record with UPI adav9020 so it will be unique.

(1 mark)

(e) Can you add the following student to the Students table? Why?

UPI: dden9011, Daniel Denden

No. There is already a record with UPI dden9011. The primary key is UPI and primary keys must be unique.

(1 mark)

(f) Given the above setting of the relationship between the two tables, what will happen to the Marks table if we delete the following student from the Students table?

UPI: msmi9032, Michael Smith

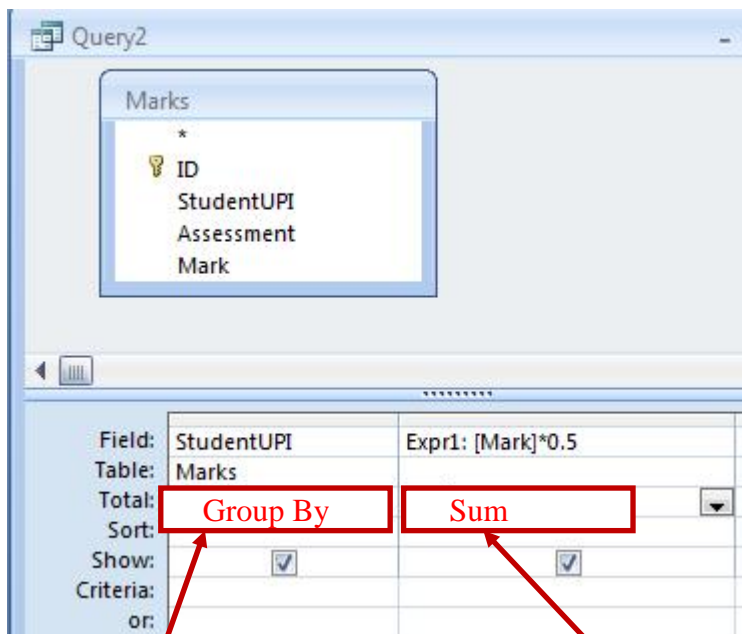The records for the exam and test marks for StudentUPI msmi9032 will be deleted.

(1 mark)

CONTINUED

(g) What is the SQL command to display all UPIs in alphabetical order as in the following diagram?

Query1
UPI
adav9017
ccam9005
dden9011
epar9008
jfon9002
…

SELECT UPI
FROM Students
ORDER BY UPI

(2 marks)

(h) We would like to calculate the final mark as per the output in Query2 on the right below. Please select the most appropriate option in the following boxes.

Query2	
StudentUPI	**Expr1**
adav9017	72.5
msmi9032	87.5
mwen9003	47.5

A. Sum
B. Group By
C. Count
D. Total
E. Each

A. Max
B. Group By
C. Min
D. Count
E. Sum

(2 marks)

CONTINUED

- Overflow Sheet 1 -
Write the question number and letter next to your answer. You must ALSO indicate in the allotted space that you have used the overflow sheet.

ID..…………………….

- Overflow Sheet 2 -
**Write the question number and letter next to your answer. You must ALSO indicate in
the allotted space that you have used the overflow sheet.**

CONTINUED

ID..…………………….

- Overflow Sheet 3 -
Write the question number and letter next to your answer. You must ALSO indicate in the allotted space that you have used the overflow sheet.

ID..…………………….

Rough Working – This page will not be marked

ID..…………………….

Rough Working – This page will not be marked

Rough Working – This page will not be marked