

[C054/SQP093]

Higher
Information
Systems
Specimen Question Paper

Time: 2 hours 30 minutes

NATIONAL
QUALIFICATIONS

Attempt **all** questions in Section I and all of the questions from **one** of the other **three** sections.

Read all questions carefully.

Write your answers in the answer book provided. Do not write on the question paper.

Write as neatly as possible.

SECTION I

Attempt all questions in this section

- | | <i>Marks</i> |
|---|--------------|
| 1. (a) Explain the difference between <i>data</i> and <i>information</i> . | 1 |
| (b) Describe the main features that distinguish a <i>relational</i> database from a <i>flat-file</i> database. | 3 |
| (c) A data model of a large construction project is designed to allow the project manager to keep track of delivery dates of materials, cost of materials, employee details, wage costs, each supplier's contact details and overall budget. When data is added to the database certain <i>validity checks</i> are performed. | |
| (i) Explain the term <i>validity check</i> . | |
| (ii) Describe a suitable validity check on the data. | 2 |
| (d) The database system is used to find out information about the construction project. For each of the following, state whether the information is <i>strategic</i> , <i>tactical</i> or <i>operational</i> . | |
| (i) The date for the next delivery of materials. | |
| (ii) The total wage costs for the project. | 2 |
| (e) The construction project staff use an <i>intranet</i> . Describe two features of an intranet that could improve decision making, planning and control of the project. | 2 |
| | |
| 2. A medical research team has compiled a large amount of data about patients who suffer from smoking-related diseases. The data is stored in a database and consists of statistics relating to recovery rates, death rates and treatment strategies for thousands of patients suffering from many diseases. The team wishes to make this data available to as many people as possible. They realise that they will need to work out a number of different ways to distribute the data in formats suitable for the people receiving it. | |
| (a) (i) Suggest two types of media that they might consider using to distribute their data. | |
| (ii) Briefly describe the target audiences for each medium. | |
| (iii) State what would need to be done to convert the data into suitably formatted information for each audience. | 4 |
| (b) One of the team suggests allowing members of the public to come to their laboratory and interrogate their database in person. Discuss the implications of this method of distribution. | 2 |
| (c) A tobacco company might want the data on death rates removed from the published information as it claims that there is no evidence that the deaths were caused by smoking. The company might claim that the <i>Data Protection Act (1984)</i> states that information in a database must be correct and so the death rates must be removed. | |
| (i) Comment on the legality of the tobacco company's request. | 1 |
| (ii) If this data was removed from the database, discuss the effect on the completeness, accuracy and value of the medical team's findings. | 3 |

3. A library has a manual system of recording its stock and borrowers on index cards. It is in the process of converting to a computerised database system.

It has 1200 borrowers and a stock of 10,000 books. Each book has

- a ten digit ISBN number which identifies the title and author
- a numeric code which classifies the category (for example astronomy, computing, gardening)
- a unique stock number
- the date it was added to the library stock
- how much it cost
- the date it is borrowed.

A borrower's name and address are recorded when tickets are first issued. A maximum of four tickets can be issued to each borrower.

- (a) The following data model of the library system shows the primary entities and their component data items.

BOOK:

ISBN, Title, Author, Category, Stocknumber, Datebought, Price, Borrowdate

BORROWER:

Name, Address

- (i) What are the primary keys for each of these entities?
 (ii) What change could be made to BORROWER to improve the model?

2

- (b) The following relation table is part of the database.

Name	Stocknumber	Borrowdate
Swan, Chris	1324352	12/03/99
Davis, Jo	4215463 5421546 2243884	13/03/99
Kerr, Sam	3132456	13/03/99

- (i) Convert this un-normalised relation table into first normal form.
 (ii) What would be the primary key for the new relation?
- (c) When the system is computerised each of the primary entities is stored in a separate file. Design a new entity called LOAN which would record when a book is borrowed.
- (d) State **one** process that would be performed when a book is returned.
- (e) Construct a data dictionary for the library data model.
 State any assumptions you make about the data items to be stored.
- (f) Using the manual system the librarian could easily see what books were due to be returned on a given day. Give an example of a report that the librarian could generate using the computerised system that could not easily be produced using the manual system.

2

2

1

2

1

4. The Internet is a large information system that provides a range of information services such as the World Wide Web (WWW) and USENET newsgroups. These services are provided by complex computer databases.

(a) The WWW can be described as a *hierarchical database system*. Each object in this database (called a “page”) is accessed using a unique Uniform Resource Location (URL) which has the following syntax.

protocol://machine/directory/file

With reference to this addressing scheme, describe **one** similarity and **one** difference between the WWW and a hierarchical database system. 2

(b) The WWW has a number of search engines such as *AltaVista* and *Lycos*. These search services provide a query language to assist users to locate specific information. The queries can normally be expressed in natural language or using Boolean operators.

(i) Explain the difference between natural language queries and Boolean queries. Give an example of each.

(ii) In relation to Boolean queries, explain the meaning of *operator*, *precedence* and *wildcards*. Illustrate your answer with an appropriate example of each. 4

(c) Here are two alternative views on the potential impact of the Internet on developing countries.

“Internet-based inequalities are deeply rooted in the political and economic order of the present world and a handful of nations consistently dominate. Rarely does anyone in power talk about a more equal and more just human global order and the sense of powerlessness among the poor and downtrodden.”

[Zar Ni, Free Burma Coalition]

“Open connectivity, access to the most recent information and software on the same basis as everyone else and ultra low costs have made the Internet a boon for the developing world.”

[Tony Rutkowski, NGI Associates]

Discuss the relative merits of these two points of view. 4

(40)

[END OF SECTION I]

Complete ONE of the next THREE sections

SECTION II

Computer Application Software

Marks

5. A firm wishes to purchase software to send out personalised letters to customers to advise them of special offers. The company has over 500 customers. A sample letter is shown below.

SQA TV & VIDEO
Mrs Fraser 23 Market Street Mainstown
Dear Mrs Fraser
As a valued customer, we would like you to be the first to know that we are now offering up to 20% discount on selected models from our range of televisions and videos.
Please call in to see how you could benefit from some of our special offers.
Yours sincerely
<i>P. Rankine</i>
Paul Rankine (Manager)

- (a) Describe how the 500 personalised letters could be efficiently produced using:
- (i) only a database package;
 - (ii) only a word processing package;
 - (iii) a combination of a database package and a word processing package. 3
- (b) If the firm intended purchasing only one package, would you recommend a word processing package or a database package? Explain your answer. 1
- (c) Having purchased this software, the firm will now have to install it. Describe **three** factors affecting the installation of this software. 3
- (d) Outline the legal constraints when installing the following:
- (i) commercial software;
 - (ii) freeware;
 - (iii) shareware. 3

6. Most contemporary software allows a wide range of customisation.
- (a) Explain the distinction between customising software at operating system level and customising software at application level.
Give **one** example of a customisation at operating system level and **one** example of a customisation at application level. 3
- (b) Suggest a way in which software could be customised to:
- (i) reflect personal preferences;
 - (ii) improve productivity;
 - (iii) enhance ease of use. 3
- (c) (i) Describe **two** examples of contemporary developments relating to the functionality of application software. 2
- (ii) Describe the stimulus to change for **one** of these developments. 2
7. InfoBase 2 is a powerful, relational database package costing £300 with many advanced features.
- (a) In the context of a database system, explain each of the following features.
- (i) *Automation*
 - (ii) *Editing*
 - (iii) *Object linking*
 - (iv) *Proofing tools*
 - (v) *Report generation* 5
- (b) The database system is claimed to be *Internet compatible*.
What does this expression mean in the context of a database system? 2
- (c) The first version of InfoBase (InfoBase 1) was originally a shareware product and is still available in this form.
Describe the advantages and disadvantages of shareware compared to commercial products. 3
- (30)**

[END OF SECTION II]

SECTION III

Expert Systems

Marks

8. (a) An expert system consists of three components:
- (i) a *knowledge base*;
 - (ii) an *inference engine*;
 - (iii) a *user interface*.
- Describe the function of each component. 3
- (b) Expert systems commonly fall into four categories. State an appropriate category for each of the following expert systems:
- school trip organisation;
 - book purchasing;
 - garden shrub identification;
 - electrical fault identification.
- 2
- (c) Describe **two** uses made of certainty factors in an expert system. 2
- (d) A family from the north of Scotland is planning to drive to France for their summer holiday. They have purchased an expert system to help them plan the journey.
- Discuss the limitations of using an expert system for this purpose. 3
9. A motor vehicle company intends to develop an expert system that can assist in diagnosing engine faults.
- (a) Give **two** advantages and **two** disadvantages in using this expert system rather than a human expert. 4
- (b) Describe the stages involved in setting up the expert system. 3
- (c) Two methods of deductive reasoning that can be supported in an expert system are *forward chaining* and *backward chaining*. Which method would you suggest for the expert system for the motor vehicle company?
- Justify your answer with appropriate examples. 3

10. A garden centre sells a wide range of garden products. Different gardening experts are often invited to visit the centre and provide customers with advice on a variety of gardening matters. Customers ask many questions, such as the following.

- Which type of hedge should I buy?
- What is the best lawnmower?
- How do I remove the moss from my grass?

(a) Two alternatives to the human experts are being suggested. One is to enter all the information into a database and the other to create an expert system using an expert system shell. Discuss the advantages and disadvantages of each of these solutions. 4

(b) The garden centre decides to create the expert system. One expert offers the following advice on planting bulbs.

“Hyacinth bulbs should be planted during October or November with between 10 and 15 cm of soil above the top of the bulb depending on soil type. Hyacinths flower in mid-spring and are suitable for planting among shrubs. One variety, borne on stems up to 20 cm high, has bright blue flowers with a fine white rim.”

Another expert offers the following general advice about planting bulbs.

“In a light, free-draining soil, bulbs should be planted more deeply than in heavy, sticky soil.”

Make up design rules, relating to the planting of hyacinths, which represent the combined advice offered by both experts. The rules should be expressed in a form with which you are familiar, for example:

IF condition THEN conclusion
or
conclusion IF condition.

(c) Using the garden centre expert system as an example, illustrate **two** types of justification features you would expect the expert system to have. 4

(30)

[END OF SECTION III]

SECTION IV

Hypermedia

Marks

11. Dan Development Ltd use a hypermedia system called MetaPage. The system runs on a mainframe computer and allows users to collaborate on projects. A typical MetaPage screen display is shown below.

```
-----  
Welcome to MetaPage  
1. Start a Text Conference  
2. Locate a Library Document  
3. Start a Collaborative Document  
4. Send an Electronic Message  
5. Add/Edit Client Contacts Database  
6. Add/Edit Stock Control Database  
7. Return to Previous Level  
-----  
P - Print : B - Back : H - Help : F - Find : I - Index : M - Mark : Q - Quit  
-----
```

- (a) Of which generation of hypermedia is MetaPage an example? 1
- (b) MetaPage uses a text-based user interface. Describe what distinguishes a text-based interface from each of the following styles: 3
- (i) windows-based user interface;
 - (ii) frames-based user interface.
- (c) Describe a situation in which a frames-based user interface would be more appropriate than a windows-based interface. 1
- (d) Dan Development Ltd uses hypermedia for collaborative working. Describe another use of hypermedia in the area of reference materials. 2
- (e) Explain how Dan Development Ltd could use an *intranet* to improve the efficiency of their organisation. 3
12. TrueVision, a design company, has been asked to provide an interactive CD-ROM for a new Hollywood film. The film's producers have provided them with video clips and the soundtrack from the film.
- (a) TrueVision has two different authoring packages available. One package conforms to the Dexter model and the other to the Amsterdam model. 3
- Which model is the more suitable for this application? Explain your answer.
- (b) The Dexter model describes three layers. 3
- (i) Explain the role the *Storage Layer* plays in the Dexter model.
 - (ii) At run-time a copy of the component being accessed is created. State the name of this component.
- (c) Louise has been asked by TrueVision to test the finished interactive CD-ROM. She tests the guide by searching and navigating through its information. 4
- (i) Describe the process of navigating a hypermedia system.
 - (ii) Give **two** factors that Louise would examine to decide if the hypermedia product was well-structured.

13. All hypermedia systems are composed of three main data structures: *links*, *nodes* and *anchors*.
- (a) Links can be *explicit* or *virtual*. Distinguish between each of these link types. 2
 - (b) Selecting an anchor causes a link to be followed to its destination. State **two** ways that an anchor may be highlighted so that the user can identify it. 1
 - (c) The World Wide Web is an example of a hypermedia system. Give **three** reasons for the growth of the World Wide Web. Include at least **one** social and **one** economic reason. 3
 - (d) Virtual Reality (VR) can be considered a contemporary development of hypermedia. Describe **four** differences between a *desktop* VR system and an *immersive* VR system. 4
- (30)**

[END OF SECTION IV]

[END OF QUESTION PAPER]

[C054/SQP093]

Higher
Information
Systems
Specimen Marking Instructions

NATIONAL
QUALIFICATIONS

Higher Information Systems

Specimen Marking Instructions

KU - Knowledge and understanding

PS - Problem solving

Commentary on paper

Structure of paper

The layout of this paper is modelled on the existing Higher Grade Computing Studies examination. It is divided into four sections as follows:

- Section I Questions covering the core units (Database Systems and Information Organisation)
- Section II Questions covering the optional unit entitled Computer Application Software
- Section III Questions covering the optional unit entitled Expert Systems
- Section IV Questions covering the optional unit entitled Hypermedia.

There are four questions in Section 1 and three each in Sections 2, 3 and 4. Each question is worth 10 marks. Candidates are required to answer all questions in Section 1 and all the questions from **one** of the optional sections. This represents seven questions in total, worth 70 marks. This corresponds with the marks awarded for the written component within external assessment (70 marks).

Distribution of marks

The paper is marked out of 70. Forty marks are available in Section 1 (core units) and 30 marks in the optional sections (2, 3 and 4). This distribution of marks between core and option (40:30) is biased towards the optional units; a strictly arithmetical distribution of marks would warrant a 46:24 distribution. This is compensated for by ensuring that knowledge and understanding of the core topics is also assessed within all of the optional sections. This also facilitates the integration of questions which is an important part of the written examination.

The main advantage of the proposed structure (and distribution of marks) is its simple and consistent structure which would rapidly become familiar to teachers and candidates.

A table is provided at the end of the paper to relate each question to its source unit. This explains where each question comes from in terms of units, outcomes, performance criteria and range statements.

No	Commentary	
1	This integrative question combines the knowledge and understanding gained from the study of database systems and information organisation.	
Type	Question	Marking scheme
KU	(a) Explain the difference between <i>data</i> and <i>information</i> .	<ul style="list-style-type: none"> • information is data given structure and context <p>1 mark for similar answer up to maximum of 1 mark.</p>
KU	(b) Describe the main features that distinguish a <i>relational</i> database from a <i>flat-file</i> database.	<ul style="list-style-type: none"> • logical and physical characteristics of data are separated • links separate files • allows more complex data structures • flexible report generation • flexible querying • any other valid response. <p>1 mark for each bullet up to maximum of 3 marks.</p>
KU PS	<p>(c) A data model of a large construction project is designed to allow the project manager to keep track of delivery dates of materials, cost of materials, employee details, wage costs, each supplier's contact details and overall budget. When data is added to the database certain <i>validity checks</i> are performed.</p> <p>(i) Explain the term <i>validity check</i>. (ii) Describe a suitable validity check on the data.</p>	<ul style="list-style-type: none"> • (i) test to see if data is within a given range. <p>mark similar answer up to maximum of 1 mark.</p> <ul style="list-style-type: none"> • (ii) 1 mark for sensible validity check within context stated eg dates could be checked for correct number of days in month. <p>Half mark for suitable field, half mark description of check. Maximum of 1mark</p>
KU	<p>(d) The database system is used to find out information about the construction project. For each of the following, state whether the information is <i>strategic, tactical or operational</i>.</p> <p>(i) The date for the next delivery of materials. (ii) The total wage costs for the project.</p>	<ul style="list-style-type: none"> • (i) operational <p>1 mark</p> <ul style="list-style-type: none"> • (ii) strategic. <p>1 mark</p>
KU	(e) The construction project staff use an <i>intranet</i> . Describe two features of an intranet that could improve decision making, planning and control of the project.	<ul style="list-style-type: none"> • allows communication via email/voicemail • allows all staff access to database • allows managers to issue instructions • provides up to date information for decision making • provides information for financial control • any other valid response. <p>1 mark for each bullet up to maximum of 2 marks.</p>

No	Commentary	
2	This question tests knowledge and understanding of information organisation. Some knowledge of the legal and ethical considerations of data storage is required.	
Type	Question	Marking scheme
<p>KU</p> <p>KU</p> <p>PS</p>	<p>A medical research team has compiled a large amount of data about patients who suffer from smoking-related diseases. The data is stored in a database and consists of statistics relating to recovery rates, death rates and treatment strategies for thousands of patients suffering from many diseases. The team wishes to make this data available to as many people as possible. They realise that they will need to work out a number of different ways to distribute the data in formats suitable for the people receiving it.</p> <p>(a) (i) Suggest two types of media that they might consider using to distribute their data.</p> <p>(ii) Briefly describe the target audiences for each medium.</p> <p>(iii) State what would need to be done to convert the data into suitably formatted information for each audience.</p>	<p>(a)</p> <p>(i) Identify two appropriate media from paper, electronic, broadcast</p> <p>1 mark for 2 media, maximum 1 mark</p> <p>(ii) Identify target audiences</p> <p>1 mark for 2 appropriate audiences, maximum 1 mark</p> <p>(iii) Describe the conversion of data into information</p> <p>1 mark for each correct description up to a maximum of 2 marks</p> <p>Media Paper: Medical journal Audience: medical specialists, doctors. Data conversion: Present all data with explanatory notes on conclusions reached. Patient names should be removed or altered.</p> <p>Media Paper: Newspaper Audience: general public. Data conversion: Convert data into summarised text, omitting technical information and patient names to be removed.</p> <p>Media: Electronic CD ROM Audience: general public Data conversion: distribute database with suitable search engine. Patients names should be removed or altered.</p> <p>Or</p> <p>Internet Audience: general public Data conversion: convert data to pages of information formatted in HTML or create tables of data on web pages. Patients names should be removed or altered.</p> <p>Or</p> <p>Broadcast Target audience: general public Data conversion: press release of summarised text. Patient names should be removed.</p>

Type	Question	Marking scheme
KU	(b) One of the team suggests allowing members of the public to come to their laboratory and interrogate their database in person. Discuss the implications of this method of distribution.	<ul style="list-style-type: none"> • security of data • privacy of data subjects • presentation of data as information • cost of allowing access or price charged for access • user guidance on searching and navigating system <p>1 mark for each bullet up to maximum of 2 marks.</p>
KU	<p>(c) A tobacco company might want the data on death rates removed from the published information as it claims that there is no evidence that the deaths were caused by smoking. The company might claim that the <i>Data Protection Act (1984)</i> states that information in a database must be correct and so the death rates must be removed.</p> <p>(i) Comment on the legality of the tobacco company's request.</p> <p>(ii) If this data was removed from the database, discuss the effect on the completeness, accuracy and value of the medical team's findings.</p>	<p>(i) correctly identify that the tobacco company is not the data subject and therefore has no right to have data amended or deleted.</p> <p>1 mark up to maximum of 1 mark.</p> <p>(ii)</p> <ul style="list-style-type: none"> • lack of death rate data detracts from accuracy of conclusions • lack of death data detracts from value of information • data is incomplete. <p>1 mark for each bullet up to maximum of 3 marks.</p>

Type	Commentary
3	<p>This database systems question describes a scenario where a library is switching from a manual system to a database. A description of the library's database is given which allows students to apply their knowledge and understanding of database systems to provide practical solutions to the problems set.</p> <p>The database model used is possibly unrealistic, but has been chosen to allow students to demonstrate their understanding of basic database terminology and structures.</p>

Type	Question	Marking scheme																		
PS	<p>A library has a manual system of recording its stock and borrowers on index cards. It is in the process of converting to a computerised database system.</p> <p>It has 1,200 borrowers and a stock of 10,000 books. Each book has</p> <ul style="list-style-type: none"> • a ten digit ISBN number which identifies the title and author • a numeric code which classifies the category (for example astronomy, computing, gardening) • a unique stock number • the date it was added to the library stock • how much it cost • the date it is borrowed. <p>A borrower's name and address are recorded when tickets are first issued. A maximum of four tickets can be issued to each borrower.</p> <p>(a) The following data model of the library system shows the primary entities and their component data items.</p> <p>BOOK: ISBN, Title, Author, Category, Stocknumber, Datebought, Price, Borrowdate</p> <p>BORROWER: Name, Address</p> <p>(i) What are the primary keys for each of these entities? (ii) What change could be made to BORROWER to improve the model?</p>	<p>(a) (i) BOOK - Stocknumber BORROWER - Name + Address</p> <p>Half mark for each, maximum 1 mark</p> <p>(ii) Add a unique code for each borrower eg ID number as a new data item.</p> <p>1 mark if new data item suggested determines both name and address, maximum 1 mark.</p>																		
PS	<p>(b) The following relation table is part of the database</p> <p><i>(table of Name, Stocknumber, Borrowdate)</i></p> <p>(i) Convert this un-normalised relation table into first normal form. (ii) What would be the primary key for the new relation?</p>	<p>(b) (i)</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Stocknumber</th> <th>Borrowdate</th> </tr> </thead> <tbody> <tr> <td>Swan, Chris</td> <td>1324352</td> <td>120399</td> </tr> <tr> <td>Davis, Jo</td> <td>4215463</td> <td>130399</td> </tr> <tr> <td>Davis, Jo</td> <td>5421546</td> <td>130399</td> </tr> <tr> <td>Davis, Jo</td> <td>2243884</td> <td>130399</td> </tr> <tr> <td>Kerr, Sam</td> <td>3132456</td> <td>130399</td> </tr> </tbody> </table> <p>1 mark if table completely correct</p> <p>(ii) Primary key: Name + Stocknumber</p> <p>1 mark if both fieldnames correct.</p>	Name	Stocknumber	Borrowdate	Swan, Chris	1324352	120399	Davis, Jo	4215463	130399	Davis, Jo	5421546	130399	Davis, Jo	2243884	130399	Kerr, Sam	3132456	130399
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Type	Question	Marking scheme																																				
PS	(c) When the system is computerised each of the primary entities is stored in a separate file. Design a new entity called LOAN which would record when a book is borrowed.	<p>(c) New entity to look like: LOAN Stocknum, ID number, Borrowdate</p> <p>2 marks if correct.</p> <p>1 mark if Name + Address is used in new entity instead of IDnumber (or equivalent)</p>																																				
PS	(d) State one process that would be performed when a book is returned.	<p>(d) Delete data in Borrowdate</p> <p>1 mark</p> <p>or</p> <p>If previous answers included adding flag to LOAN to show when borrowed then resetting this flag also</p> <p>1 mark maximum 1 mark</p>																																				
PS	(e) Construct a data dictionary for the library data model. State any assumptions you make about the data items to be stored.	<p>(e) Minimum table as follows, size is approximate and any reasonable size should be allowed. Rows should include borrower ID number at least. Extra columns may include validation or range, security or priority codes, output formats.</p> <table border="1" data-bbox="906 1128 1289 1487"> <thead> <tr> <th>Item</th> <th>Data type</th> <th>Size</th> </tr> </thead> <tbody> <tr> <td>Stocknum</td> <td>integer</td> <td>10</td> </tr> <tr> <td>ISBN</td> <td>integer</td> <td>10</td> </tr> <tr> <td>Datebought</td> <td>date</td> <td>6</td> </tr> <tr> <td>Price</td> <td>currency</td> <td>6</td> </tr> <tr> <td>Title</td> <td>alpha</td> <td>100</td> </tr> <tr> <td>Author</td> <td>alpha</td> <td>100</td> </tr> <tr> <td>Category</td> <td>integer</td> <td>10</td> </tr> <tr> <td>Name</td> <td>alpha</td> <td>40</td> </tr> <tr> <td>Address</td> <td>alpha</td> <td>40</td> </tr> <tr> <td>Borrowdate</td> <td>date</td> <td>6</td> </tr> <tr> <td>ID number</td> <td>integer</td> <td>10</td> </tr> </tbody> </table> <p>1 mark for at least 11 correct item names.</p> <p>1 mark for correct data types with reasonable sizes even if table is incomplete.</p> <p>Maximum 2 marks</p>	Item	Data type	Size	Stocknum	integer	10	ISBN	integer	10	Datebought	date	6	Price	currency	6	Title	alpha	100	Author	alpha	100	Category	integer	10	Name	alpha	40	Address	alpha	40	Borrowdate	date	6	ID number	integer	10
Item	Data type	Size																																				
Stocknum	integer	10																																				
ISBN	integer	10																																				
Datebought	date	6																																				
Price	currency	6																																				
Title	alpha	100																																				
Author	alpha	100																																				
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PS	(f) Using the manual system the librarian could easily see what books were due to be returned on a given day. Give an example of a report that the librarian could generate using the computerised system that could not easily be produced using the manual system.	<p>(f) Response should be a report that would not be practical with a manual system. Possible responses might be:</p> <p>Number of books on loan to individual borrower Categories of books borrowed by individuals</p> <p>1 mark for any reasonable response up to maximum of 1 mark.</p>																																				

No.	Commentary	
4	This integrative question combines the knowledge and understanding gained from the study of database systems and information organisation. It does this through the context of the Internet.	
Type	Question	Marking scheme
KU	<p>The Internet is a large information system that provides a range of information services such as the World Wide Web (WWW) and USENET newsgroups. These services are provided by complex computer databases.</p> <p>(a) The WWW can be described as <i>hierarchical database system</i>. Each object in this database (called a 'page') is accessed using a unique Uniform Resource Locator (URL) which has the following syntax:</p> <p style="text-align: center;">protocol://machine/directory/file</p> <p>With reference to this addressing scheme, describe one similarity and one difference between the WWW and a hierarchical database system.</p>	<p>Similarities:</p> <ul style="list-style-type: none"> • Parent-child relationship between records. • Parent owns child. • Often regarded as a tree structure. <p>Differences:</p> <ul style="list-style-type: none"> • No record can have more than one parent. • WWW can have many 'parents' and 'children'. <p>½ mark for each similarity or difference up to maximum of 1½ marks. At least one similarity or difference must be provided or maximum marks 1.</p> <p>The URL shows a hierarchy with the machine/directory providing a pathname to the specific piece of information similar to a hierarchical filing system. ½ mark</p>
KU	<p>(b) The WWW has a number of search engines such as <i>AltaVista</i> and <i>Lycos</i>. These search services provide a query language to assist users to locate specific information. The queries can normally be expressed in natural language or using Boolean operators.</p> <p>(i) Explain the difference between natural language queries and Boolean queries. Give an example of each.</p> <p>(ii) In relation to Boolean queries, explain the meaning of <i>operator</i>, <i>precedence</i> and <i>wildcards</i>. Illustrate your answer with an appropriate example of each.</p>	<p>Natural language query:</p> <ul style="list-style-type: none"> • Search instruction using English type syntax. • Often in form of a question. • Evaluated in terms of proximity of terms to each other or phrase recognition. <p>Boolean:</p> <ul style="list-style-type: none"> • Search instruction involving Boolean operators. • More complex queries. • Stricter syntax. <p>½ mark for any bullet; ½ mark for any example. Maximum 1 mark for natural language; 1 mark for Boolean.</p> <p>Operator:</p> <ul style="list-style-type: none"> • such as AND, OR, NOT and ADJ <p>Precedence:</p> <ul style="list-style-type: none"> • Means of evaluating Boolean expression. • Hierarchy of operator precedence. <p>Wildcards:</p> <ul style="list-style-type: none"> • A symbol representing any sequence of characters. <p>½ mark each bullet; - ½ for inappropriate example or missing example (maximum -1)</p>

Type	Question	Marking scheme
PS	<p>(c) Here are two alternative views on the potential impact of the Internet on developing countries.</p> <p><i>"Internet-based inequalities are deeply rooted in the political and economic order of the present world and a handful of nations consistently dominate. Rarely does anyone in power talk about a more equal and more just human global order and the sense of powerlessness among the poor and downtrodden."</i> [Zar Ni, Free Burma Coalition]</p> <p><i>"Open connectivity, access to the most recent information and software on the same basis as everyone else and ultra low costs have made the Internet a boon for the developing world."</i> [Tony Rutkowski, NGI Associates]</p> <p>Discuss the relative merits of these two points of view.</p>	<ul style="list-style-type: none"> • Both points of view are valid. • Internet provides opportunities and threats to developing countries. • Elements of truth in both quotations. • Internet is fundamentally egalitarian. • But access to the Internet is uneven. • Opportunities afforded by the Internet may be dependent on government action. • Previous technological innovations have tended to benefit developed countries more than developing countries. • Potential for Internet to produce information rich and information poor countries. • Greater access to diverse sources of information should improve education in all countries. • There are examples of developing countries capitalising on the Internet (eg India). • Any other valid point. <p>½ mark for each bullet in bold (maximum 1).</p> <p>¼ for each additional bullet (up to maximum of 3).</p>

No	Commentary	
5	This question combines the knowledge and understanding and problem solving gained from the study of software selection and installation with the ability to implement a designed database structure.	
Type	Question	Marking Scheme
PS	<p>A firm wishes to purchase software to send out personalised letters to customers to advise them of special offers. The company has over 500 customers.</p> <p>(a) Describe how the 500 personalised letters could be produced using:</p> <p>(i) only a database package;</p> <p>(ii) only a word processing package;</p> <p>(iii) a combination of a database package and a word processing package.</p>	<ul style="list-style-type: none"> • Record structures defined and data entered • Report generation used to define custom layout • Report in form of a letter with appropriate field names entered in appropriate places • Report run <p>OR</p> <ul style="list-style-type: none"> • Record structures defined and data entered • Text of letter entered as a field or as descriptive text and then print out all records <p>(½ mark for each bullet, maximum of 1 mark)</p> <ul style="list-style-type: none"> • Source document created with suitable text and field names entered in appropriate places • Data created in CSV format • Print merge option used to merge data with letter <p>(½ mark for each bullet, maximum of 1 mark)</p> <ul style="list-style-type: none"> • Data document created with field names and data • Source document created with suitable text and field names entered in appropriate places • Print merge option used to merge data with letter <p>(½ mark for each bullet, maximum of 1 mark)</p>

PS	(b) If the firm intended purchasing only one package, would you recommend a word processing package or a database package? Explain your answer.	<p><i>Word Processing</i> Predominantly text based exercise with relatively simple construction of a CSV file to create the data. Or any other valid reason.</p> <p><i>Database</i> Data of over 500 customers contained in records and report created in the form of a letter with filed names appropriately placed. Or any other valid reason.</p> <p>(1 mark for explanation of recommendation)</p>
KU	(c) Having purchased this software, the firm will now have to install it. Describe three factors affecting the installation of this software.	<ul style="list-style-type: none"> • Compatibility with central processing unit (CPU) • Compatibility of operating system • Amount and availability of RAM • Amount of free disk space • Availability of peripherals • Configuration of operating system <p>1 mark for any one of these bullets (maximum 3)</p>
KU	<p>(d) Outline the legal constraints when installing the following:</p> <p>(i) commercial software</p> <p>(ii) freeware</p> <p>(iii) shareware</p>	<ul style="list-style-type: none"> • Commercial programs cannot be legally copied and distributed. • You would be breaking the law if you copied a program that you were using at work and installed it on your own machine at home unless this was stated in the conditions of sale. • It is, however, perfectly legal to purchase software from a friend and install it on your own computer as long as this software is then uninstalled by the friend. • It is perfectly legal to download freeware programs from the Internet, copy and distribute them to other people. • Freeware cannot be sold or modified because the creator retains copyright. • Shareware programs can also be downloaded from the Internet but sometimes the program states that you can evaluate it for 30 days. • You do not have to pay the author to use the program after the 30 days have expired. • After the trial time is elapsed, you must either erase the program from you disk or register the program whereupon you will be required to pay a fee. <p>1 mark each for any one of these bullets (maximum 3)</p>

No	Commentary	
6	This question relates mainly to the knowledge and understanding gained from the study of software customisation and the contemporary developments relating to application software.	
Type	Question	Marking scheme
KU	<p>Most contemporary software allows a wide range of customisation.</p> <p>(a) Explain the distinction between customising software at operating system level and customising software at application level. Give one example of a customisation at operating system level and one example of a customisation at application level.</p>	<ul style="list-style-type: none"> • User interface is normally configured through the operating system whereas program specific customisations are normally configured within the application. • An OS customisation affects all the application packages on the system whereas an application level customisation is specific to that application. <p>(Either of these bullets for 1 mark)</p> <p><i>Examples:</i> <i>OS level</i> Customisation of fonts at OS level will act as default fonts to the other applications on the system. Customisation of desktop colours; default icons</p> <p><i>Application level</i> Customisation of fonts at application level would be allocated to a template and only be available within the application. Customisation of toolbars; useful groups of commands</p> <p>Or any other valid example (1 mark for each example, maximum 2)</p>
KU	<p>(b) Suggest a way in which software could be customised to:</p> <p>(i) reflect personal preferences;</p> <p>(ii) improve productivity;</p> <p>(iii) enhance ease of use.</p>	<ul style="list-style-type: none"> • changing colours, icons, etc • changing user interface • any other valid response • programming the keyboard with common text • use of macros • use of templates • use of wizards • any other valid response • customising the toolbar to include common commands • use of on-line help • use of macros • use of hot key presses • any other valid response <p>1 mark each for any bullet (maximum 3)</p>

<p>KU</p>	<p>(c) (i) Describe two examples of contemporary developments relating to the functionality of application software.</p>	<ul style="list-style-type: none"> • Software with Web publishing facilities • Software with browsing facilities • Graphics including animation programs • On-line grammar and spell checking • Context sensitive help (using AI) • Layering in bit-mapped graphic packages • Increase use of plug-ins to increase functionality • Any other valid response <p>1 mark for any bullet (maximum 2)</p>
<p>KU</p>	<p>(ii) Describe the stimulus to change for one of these developments.</p>	<ul style="list-style-type: none"> • Growth of the Internet and electronic communication • Increased performance of hardware • User demand for enhanced and advanced software features • Any other valid response <p>1 mark for any bullet (maximum 2) or 2 marks for full description</p>

No	Commentary																					
7	This question relates mainly to the knowledge and understanding gained from the study of the advanced features of contemporary application software and the comparison of commercial and shareware software.																					
Type	Question	Marking scheme																				
KU	<p>InfoBase 2 is a powerful, relational database package costing £300 with many advanced features.</p> <p>(a) In the context of a database system, explain each of the following features:</p> <p>(i) <i>Automation</i></p> <p>(ii) <i>Editing</i></p> <p>(iii) <i>Object linking</i></p> <p>(iv) <i>Proofing tools</i></p> <p>(v) <i>Report generation</i></p>	<p>Use of macros, and modules (based on visual scripting language)</p> <p>Adding, amending, deleting records and fields. Creating computed fields</p> <p>Link any object (eg file) into a database either by a reference or by embedding</p> <p>Spelling and grammar checking</p> <p>Construct a report using queries, searching and sorting</p> <p>1 mark each (maximum 5)</p>																				
KU	<p>(b) The database system is claimed to be <i>Internet compatible</i>. What does this expression mean in the context of a database system?</p>	<ul style="list-style-type: none"> • Web publishing facilities • Embedded URLs (hyperlink to the Internet) <p>1 mark each</p>																				
KU	<p>(c) The first version of InfoBase (InfoBase 1) was originally a shareware product and is still available in this form. Describe the advantages and disadvantages of shareware compared to commercial products.</p>	<table border="0" style="width: 100%;"> <tr> <td colspan="2" style="text-align: center;">Shareware</td> </tr> <tr> <td style="vertical-align: top;">Advantages</td> <td style="vertical-align: top;">Disadvantages</td> </tr> <tr> <td>Cheaper to purchase</td> <td>Limited documentation</td> </tr> <tr> <td>Easy to obtain</td> <td>Limited functionality</td> </tr> <tr> <td>Wide range of applications available</td> <td>Limited compatibility</td> </tr> <tr> <td></td> <td>Poorly designed user interface</td> </tr> <tr> <td colspan="2" style="text-align: center;">Commercial</td> </tr> <tr> <td style="vertical-align: top;">Advantages</td> <td style="vertical-align: top;">Disadvantages</td> </tr> <tr> <td>Feature-rich</td> <td>Some advanced features not all required</td> </tr> <tr> <td>Widely compatible</td> <td></td> </tr> </table> <p>(½ mark for each advantage/disadvantage up to a maximum of 3)</p>	Shareware		Advantages	Disadvantages	Cheaper to purchase	Limited documentation	Easy to obtain	Limited functionality	Wide range of applications available	Limited compatibility		Poorly designed user interface	Commercial		Advantages	Disadvantages	Feature-rich	Some advanced features not all required	Widely compatible	
Shareware																						
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Advantages	Disadvantages																					
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No	Commentary	
8	This question tests knowledge and understanding of expert systems. The question also presents some unfamiliar contexts for the candidate to use in problem solving situations.	
Type	Question	Marking scheme
KU	<p>(a) An expert system consists of three components:</p> <ul style="list-style-type: none"> • a knowledge base; • an inference engine; • a user interface. <p>Describe the function of each component.</p>	<p>Knowledge base - This component contains the domain knowledge in a variety of possible forms.</p> <p>Inference Engine - This component controls how the knowledge in the knowledge base will be searched for matches in response to a user's query.</p> <p>User Interface - The user enters the query via the consulting environment that is part of the user interface</p> <p>1 mark for each correct description</p>
PS	<p>(b) Expert systems commonly fall into four categories. State an appropriate category for each of the following expert systems:</p> <ul style="list-style-type: none"> • school trip organisation; • book purchasing; • garden shrub identification; • electrical fault identification. 	<p>school trip - plan or advise book purchase - advise garden shrub identification - classify electrical fault identification - diagnose</p> <p>0.5 marks for each correct answer - suitable alternatives are acceptable</p>
KU	<p>(c) Describe two uses made of certainty factors in an expert system.</p>	<p>Any two correct uses of certainty factors eg. The use of certainty factors is a numerical method that allows an expert system to represent uncertain or ambiguous knowledge. Certainty factors are also used to indicate the reliability of advice given by the expert system.</p> <p>1 mark for each correct description</p>
PS	<p>(d) A family from the north of Scotland is planning to drive to France for their summer holiday. They have purchased an expert system to help them plan the journey.</p> <p>Discuss the limitations of using an expert system for this purpose.</p>	<p>Limitations could be: the expert system may not refer to that specific journey ie restricted domain; recent road alterations (new roads, road closures etc) may not be added ie expert system not updated; may not take into account hold-ups due to traffic jams, roadworks and driver alters route appropriately ie lack of common sense</p> <p>3 marks for three well discussed limitations.</p>

No	Commentary	
9	This question tests knowledge and understanding of expert systems. The question also presents some unfamiliar contexts for the candidate to use in problem solving situations.	
Type	Question	Marking scheme
KU	<p>A motor vehicle company intends to develop an expert system that can assist in diagnosing engine faults.</p> <p>(a) Give two advantages and two disadvantages in using this expert system rather than a human expert.</p>	<p>Candidates should suggest two advantages and two disadvantages related to the question eg Advantages: expert knowledge is available when needed, expert systems improve productivity, it contains multiple experience of several human experts, and it can be used to preserve valuable knowledge. Disadvantages: the huge development costs, lack of common sense knowledge, need to update knowledge in the knowledge base, restricted domain.</p> <p>1 mark for each correct advantage and disadvantage.</p>
PS	<p>(b) Describe the stages involved in setting up the expert system.</p>	<p>Candidates answer should include two characteristics of each of the three stages: acquiring knowledge, representing knowledge and validating and testing the system.</p> <p>For acquiring knowledge, candidates should refer to interviewing and observing domain experts and perhaps studying reference material.</p> <p>For representing knowledge, candidates should refer to coding the expert knowledge as facts and rules, which are written in a specialist knowledge representation language and certainty factors are used to represent uncertain knowledge.</p> <p>For validating and testing the system candidates should refer to testing the system to ensure it is correct by perhaps comparing the advice produced by the expert system with the advice suggested by the human expert or reference material. If both match then the system is considered to be valid.</p> <p>1 mark for each stage correctly described</p>
PS	<p>(c) Two methods of deductive reasoning that can be supported in an expert system are <i>forward chaining</i> and <i>backward chaining</i>. Which method would you suggest for the expert system for the motor vehicle company? Justify your answer with appropriate examples.</p>	<p>The method of reasoning for the company would be forward chaining since it starts with proven facts eg the car will not start and draws conclusions from the facts eg it must be either the battery or a fuel problem.</p> <p>1 mark for forward chaining, 1 mark for the explanation and 1 mark for suitable illustration. If candidate can provide acceptable justification for backward chaining, this too can be accepted.</p>

No	Commentary	
10	This question tests knowledge and understanding of expert systems. The question also presents some unfamiliar contexts for the candidate to use in problem solving situations.	
Type	Question	Marking scheme
PS	<p>A garden centre sells a wide range of garden products. Different gardening experts are often invited to visit the centre and provide customers with advice on a variety of gardening matters. Customers ask many questions, such as the following: Which type of hedge should I buy? What is the best lawnmower? How do I remove the moss from my grass?</p> <p>(a) Two alternatives to the human experts are being suggested. One is to enter all the information into a database and the other to create an expert system using an expert system shell. Discuss the advantages and disadvantages of each of these solutions.</p>	<p>Both the expert system and the database would be suitable to store the information for the garden centre. The expert system already has a user interface in a form that is simple for the customer to ask questions whereas the user interface for the database would need to be custom written for this purpose. Expert systems provide advice to the customer and can explain the advice it gives and why it is asking particular questions. Databases cannot justify the answers and cannot ask clarifying questions.</p> <p>1 mark for each relevant advantage or disadvantage.</p> <p>(maximum 4)</p>
PS	<p>(b) The garden centre decides to create the expert system. One expert offers the following advice on planting bulbs. "Hyacinth bulbs should be planted during October or November with between 10 and 15 cm of soil above the top of the bulb depending on soil type. Hyacinths flower in mid-spring and are suitable for planting among shrubs. One variety, borne on stems up to 20cm high, has bright blue flowers with a fine white rim." Another expert offers the following general advice about planting bulbs. "In a light, free-draining soil, bulbs should be planted more deeply than in heavy, sticky soil." Make up design rules, relating to the planting of hyacinths, which represent the combined advice offered by both experts. The rules should be expressed in a form with which you are familiar, for example: IF condition THEN conclusion or conclusion IF condition.</p>	<p>IF soil is light AND free-draining THEN plant at 15cm below the surface.</p> <p>IF soil is heavy AND sticky THEN plant at 10cm below the surface</p> <p>1 mark for each rule. Alternative, but valid rules may be accepted, but at least one rule must be from above.</p> <p>(maximum 2)</p>

<p>KU/PS</p>	<p>(c) Using the garden centre expert system as an example, illustrate two types of justification features you would expect the expert system to have.</p>	<p>The two types of justification the expert system would have are how and why.</p> <p>In the garden centre expert system the why justification may be the expert system asking the user "How many hours do you spend in the garden" and the user asks "Why do you want to know how many hours I spend in the garden?" The expert system will justify its question by suggesting a low maintenance plant.</p> <p>In the garden centre expert system, the how justification may be the expert system making the following suggestion: You should buy a <i>very powerful hedge cutter</i> And the user asks, "How did you arrive at that conclusion?" The expert system justifies its advice by saying because you said you had a lot of hedge to cut!</p> <p>1 mark for how/why and 1.5 marks for each illustration (maximum 4)</p>
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No	Commentary	
11	This question relates mainly to the knowledge and understanding and problem solving gained from the study of the historical development and architecture of hypermedia systems.	
Type	Question	Marking scheme
PS	<p>Dan Development Ltd. use a hypermedia system called MetaPage. The system runs on a mainframe computer and allows users to collaborate on projects. A typical MetaPage screen display is shown (see Question Paper).</p> <p>(a) Of which generation of hypermedia is MetaPage an example?</p>	<p>First Generation (1 mark)</p>
KU	<p>(b) MetaPage uses a text-based user interface. Describe what distinguishes a text-based interface from each of the following styles:</p> <p>(i) windows-based user interface;</p> <p>(ii) frames-based user interface.</p>	<ul style="list-style-type: none"> • Each window can display a node. • Nodes may be larger than the window area. The window may be moved to allow different regions of the node to be displayed. • Navigation is often carried out with the aid of a pointing device (mouse). • A new window may be opened to display a selected node or the node may be displayed in the current window. • Users may be able to change the size of the window as required. <p style="text-align: center;">(Any three ½ mark each)</p> <ul style="list-style-type: none"> • Display area is divided into different regions. • Each frame can display a node. • Following a link may change the structure of the frames in the display area. • Links from one frame may cause nodes to appear in other frames or in the current frame. • Users may be able to manually alter the size of a frame. <p style="text-align: center;">(Any three ½ mark each)</p> <p>(maximum 3)</p>
KU	<p>(c) Describe a situation in which a frames-based user interface would be more appropriate than a windows-based interface.</p>	<p>If the author required an item of information to be constantly displayed, such as a navigation or toolbar</p> <p style="text-align: center;">(1 mark)</p>

<p>KU</p>	<p>(d) Dan Development Ltd. uses hypermedia for collaborative working. Describe another use of hypermedia in the area of reference materials.</p>	<p>Name of suitable use (manuals, museum exhibits, dictionary, etc) (½ mark if only name is given)</p> <p>Suitable description of use. For example, description on the use of encyclopaedias, dictionaries, manuals and handbooks as well as online documents available on the World Wide Web</p> <p style="text-align: center;">(2 marks)</p>
<p>PS</p>	<p>(e) Explain how Dan Development Ltd. could use an <i>intranet</i> to improve the efficiency of their organisation.</p>	<ul style="list-style-type: none"> • An intranet could improve communication and collaboration between employees • An intranet allows information to be shared by many users within the same organisation and/or local area. • An intranet can be easily connected to the internet to extend its capabilities. • <i>Remote users can dial-up intranet and connect to it to access its information and resources.</i> • Intranets are set-up within an organisation. The information stored on the intranet is generated internally and is supplied from sources within the organisation. • any other valid point. <p style="text-align: center;">(Any three points for 3 marks)</p>

No	Commentary	
12	This question combines the knowledge and understanding and problem solving gained from the study of the architecture of hypermedia systems with the searching and navigation facilities of contemporary information systems.	
Type	Question	Marking scheme
PS	<p>TrueVision, a design company, has been asked to provide an interactive CD-ROM for a new Hollywood film. The film's producers have provided them with video clips and the soundtrack from the film.</p> <p>(a) TrueVision has two different authoring packages available to it. One package conforms to the Dexter model and the other to the Amsterdam model. Which model is the more suitable for this application? Explain your answer.</p>	<p>Amsterdam Model (1 mark)</p> <p>Amsterdam model supports the use of time-based media (1 mark)</p> <p>Amsterdam model has a mechanism to deal with resource overload (1 mark)</p>
KU	<p>(b) The Dexter model describes three layers.</p> <p>(i) Explain the role the <i>Storage Layer</i> plays in the Dexter model.</p> <p>(ii) At run-time a copy of the component being accessed is created. State the name of this component.</p>	<p>The storage layer shows how the network of nodes and links is built up (1 mark)</p> <p>The storage layer provides functions for maintaining the hypertext (1 mark)</p> <p>An instantiation (1 mark)</p>
KU	<p>(c) Louise has been asked by TrueVision to test the finished interactive CD-ROM. She tests the guide by searching and navigating through its information.</p> <p>(i) Describe the process of navigating a hypermedia system.</p> <p>(ii) Give two factors that Louise would examine to decide if the hypermedia product was well-structured.</p>	<p>Navigation is the process that allows the user to move through the hypermedia system by following links (1 mark) from node to node (1 mark)</p> <ul style="list-style-type: none"> • The amount of information displayed within each node. • The breakdown of information into a series of linked nodes associated with one topic. <p>(Any one of these bullets for 1 mark each)</p>

No	Commentary													
13	This question relates mainly to the knowledge and understanding and problem solving gained from the study of the historical development and architecture of hypermedia systems.													
Type	Question	Marking scheme												
KU	<p>All hypermedia systems are composed of three main data structures: <i>links</i>, <i>nodes</i> and <i>anchors</i>.</p> <p>(a) Links can be <i>explicit</i> or <i>virtual</i>. Distinguish between each of these link types.</p>	<p>Explicit links are created by the author and connect specific nodes (1 mark) Virtual links are generated by the hypermedia system. (1 mark)</p>												
KU	<p>(b) Selecting an anchor causes a link to be followed to its destination. State two ways that an anchor may be highlighted so that the user can identify it.</p>	<p>An anchor may be a different colour, underlined, or may include a special character.</p> <p>(any two for ½ mark each)</p>												
KU	<p>(c) The World Wide Web is an example of a hypermedia system. Give three reasons for the growth of the World Wide Web. Include at least one social and one economic reason.</p>	<p><i>Social reasons:</i> Global communication Interaction of different cultures Construction of home pages Web-based e-mail Web-based chat (Any suitable point for 1 mark)</p> <p><i>Economic reasons:</i> Growth of e-commerce Requirement for corporate information (Intranet) Teleworking - better for environment (Any suitable point for 1 mark)</p> <p><i>Technical reasons:</i> Increase in speed of modems Increase in processor power and speed ISDN lines (Any suitable point for 1 mark)</p> <p>(maximum 3)</p>												
KU	<p>(d) Virtual Reality (VR) can be considered a contemporary development of hypermedia. Describe four differences between a <i>desktop</i> VR system and an <i>immersive</i> VR system.</p>	<table border="0"> <tr> <td data-bbox="938 1458 1177 1480">Desktop Virtual Reality</td> <td data-bbox="1225 1458 1481 1480">Immersive Virtual Reality</td> </tr> <tr> <td data-bbox="938 1514 1114 1570">3D world on a 2D screen</td> <td data-bbox="1225 1514 1481 1570">3D world represented to the user as true 3D</td> </tr> <tr> <td data-bbox="938 1603 1193 1659">Input devices; mouse keyboard, joystick</td> <td data-bbox="1225 1603 1544 1749">very specialist input/output devices eg headset including position tracker, goggles, glove, and headphones</td> </tr> <tr> <td colspan="2" data-bbox="938 1783 1225 1861">Common first person perspective environment eg QuakeII</td> </tr> <tr> <td colspan="2" data-bbox="1023 1895 1481 1928" style="text-align: center;">1 mark for each point (maximum 4)</td> </tr> <tr> <td colspan="2" data-bbox="938 1962 1544 2018" style="text-align: center;">(Similar characteristics should be contrasted for full marks)</td> </tr> </table>	Desktop Virtual Reality	Immersive Virtual Reality	3D world on a 2D screen	3D world represented to the user as true 3D	Input devices; mouse keyboard, joystick	very specialist input/output devices eg headset including position tracker, goggles, glove, and headphones	Common first person perspective environment eg QuakeII		1 mark for each point (maximum 4)		(Similar characteristics should be contrasted for full marks)	
Desktop Virtual Reality	Immersive Virtual Reality													
3D world on a 2D screen	3D world represented to the user as true 3D													
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Common first person perspective environment eg QuakeII														
1 mark for each point (maximum 4)														
(Similar characteristics should be contrasted for full marks)														

SAMPLE INFORMATION SYSTEMS (HIGHER) EXAMINATION PAPER

SOURCE OF QUESTIONS

Question	Part	Section	Unit(s)	Outcome(s)	PC	Range
1	a		Information Organisation	1	a	
	b		Database Systems	1		Relationships, data models
	c	i	Database Systems	2	d	
		ii	Database Systems	2	d	
	d	i-ii	Information Organisation	1	c	
	e		Information Organisation Database Systems	2 3	f	
2	a	i	Information Organisation	2	c	
		ii	Information Organisation	1	b	
		iii	Information Organisation	1 2	a a	
	b		Information Organisation	3 4 4	d b c	
	c	i-ii	Information Organisation	2	a	
3	a	i-ii	Database Systems	1	a	
	b	i	Database Systems	1	b	
		ii	Database Systems	2	b	
	c		Database Systems	1 2	a a	
	d		Database Systems	1	e	
	e		Database Systems	1 2 2 2	a a c d	
	f		Database Systems	3	d	
4	a		Database Systems Information Organisation	1/2 2	Various b	Internet specified

Question	Part	Section	Unit(s)	Outcome(s)	PC	Range
	b	i-ii	Database Systems Information Organisation Information Organisation	3 2 3	c a d	
	c		Information Organisation Information Organisation	2 4	b a	Internet specified
5	a		Computer Application Software Database Systems	1 3	a d	
	b		Computer Application Software	1	b	
	c		Computer Application Software	2	a	
	d		Computer Application Software	2	e	
6	a		Computer Application Software	2	b	
	b		Computer Application Software	2	b	
	c	i	Computer Application Software	5	a	Functionality of software
	c	ii	Computer Application Software	5	c	
7	a		Computer Application Software	3	c	Proofing, object linking, automation
	b		Computer Application Software	3	c	
	c		Computer Application Software	4	b	
8	a		Expert Systems	1	b	
	b		Expert Systems	1	c	Unfamiliar context
	c		Expert Systems	1	b	
	d		Expert Systems	1	d	Unfamiliar context
9	a		Expert Systems	3	a	Familiar context
	b		Expert Systems	4		Familiar context
	c		Expert Systems	1		Familiar context

Question	Part	Section	Unit(s)	Outcome(s)	PC	Range
10	a		Expert Systems/Database Systems	1	a	Integration
	b		Expert Systems	3	b	Unfamiliar context
	c		Expert Systems	2	b	Unfamiliar context
11	a		Hypermedia	1	a	First generation
	b		Hypermedia	2	d	Windows, frames
	c		Hypermedia	2	d	Windows, frames
	d		Hypermedia	1	b	
	e		Hypermedia	1	d	
12	a		Hypermedia	2	a	Dexter model
	b		Hypermedia	2	a	Dexter model
	c		Hypermedia Information Organisation	2 3	c d	
13	a		Hypermedia	2	b	Links
	b		Hypermedia	2	b	Anchor
	c		Hypermedia Information Organisation	1 4	c a	
	d		Hypermedia	1	d	

[END OF MARKING INSTRUCTIONS]

