



2012 Information Systems

Intermediate 2

Finalised Marking Instructions

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SECTION 1

Question

Marks

	SECTION 1 Attempt ALL questions in this section																																																							
1.	State two reasons why manual database systems have been replaced by computerised database systems.							2																																																
DB 1.1	Any two of: <ul style="list-style-type: none">Searching/sorting and calculating can be performed much more quicklyInformation is easily accessible (by many users at the same time)Data integrity is improvedTakes up less physical spaceEasy to perform data analysisEasy to create reportsAny other suitable answer							KU																																																
2.	French schools use the following database to help pupils find pen pals in Britain.																																																							
<table><tr><th>ID</th><th>Name</th><th>Gender</th><th>Age</th><th>Country</th><th>French Speaker</th><th>Main Interest</th><th>School</th></tr><tr><td>123456</td><td>M Brady</td><td>M</td><td>15</td><td>Scotland</td><td><input checked="" type="checkbox"/></td><td>Walking</td><td>www.handytown.sch.uk</td></tr><tr><td>159875</td><td>A Gallacher</td><td>M</td><td>16</td><td>Scotland</td><td><input type="checkbox"/></td><td>Science</td><td>www.happyville.sch.uk</td></tr><tr><td>456732</td><td>T Madden</td><td>F</td><td>12</td><td>Wales</td><td><input checked="" type="checkbox"/></td><td>Skiing</td><td>www.valleyhigh.sch.uk</td></tr><tr><td>789132</td><td>G Smith</td><td>F</td><td>16</td><td>England</td><td><input type="checkbox"/></td><td>Reading</td><td>www.heartshigh.sch.uk</td></tr><tr><td>152345</td><td>M Brady</td><td>F</td><td>16</td><td>Wales</td><td><input checked="" type="checkbox"/></td><td>Swimming</td><td>www.cloverhigh.sch.uk</td></tr></table>									ID	Name	Gender	Age	Country	French Speaker	Main Interest	School	123456	M Brady	M	15	Scotland	<input checked="" type="checkbox"/>	Walking	www.handytown.sch.uk	159875	A Gallacher	M	16	Scotland	<input type="checkbox"/>	Science	www.happyville.sch.uk	456732	T Madden	F	12	Wales	<input checked="" type="checkbox"/>	Skiing	www.valleyhigh.sch.uk	789132	G Smith	F	16	England	<input type="checkbox"/>	Reading	www.heartshigh.sch.uk	152345	M Brady	F	16	Wales	<input checked="" type="checkbox"/>	Swimming	www.cloverhigh.sch.uk
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	(a)	State the most appropriate field type for the French Speaker field.						1																																																
DB 3.2		<i>Boolean</i>						PS																																																
	(b)	State the most appropriate field type for the School field.						1																																																
DB 3.2		<i>HyperLink</i>						PS																																																
	(c)	The ID field is a <i>primary key</i> . Explain the purpose of a primary key in a database.						1																																																
DB 3.1		<i>To uniquely identify each record.</i>						KU																																																

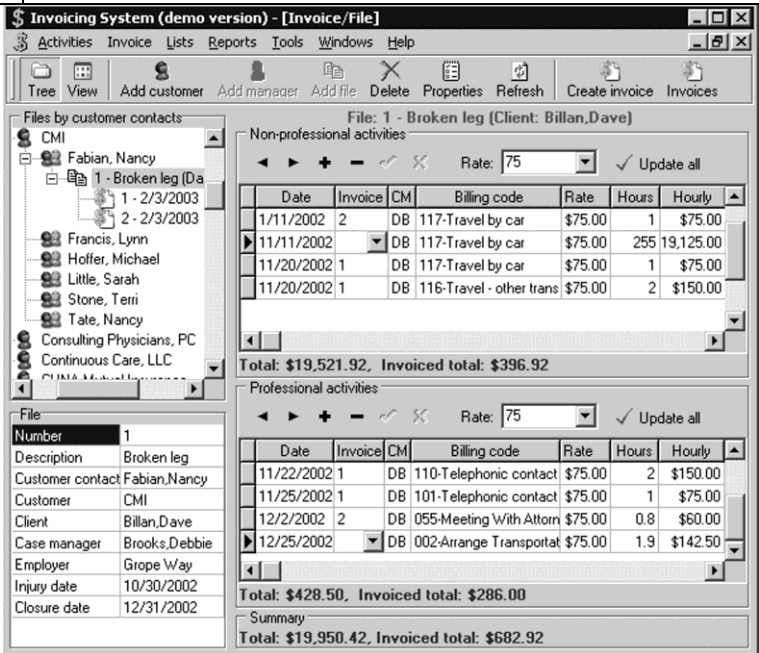
Question

Marks

3.	A library database is shown below:						
Book No.	Title	Author	Member ID	Member Name	Date Out	Date In	Fine
125	Exam Technique	B Test	155	L Cairns	15.5.2012	20.5.2012	£0.00
			236	A Porter	22.5.2012	31.5.2012	£1.20
			189	H McGhee	06.2.2012	06.4.2012	£6.50
999	Cookery Skills	A Potts	666	A Jamil	18.5.2012	20.5.2012	£0.00
			569	C Hoy	25.5.2012	30.5.2012	£0.00
	(a)	Identify one <i>multi-valued attribute</i> from the database above.					1
DB 2.1		<i>Any one of:</i> <ul style="list-style-type: none">• <i>Member ID,</i>• <i>Member Name,</i>• <i>Date Out,</i>• <i>Date In,</i>• <i>Fine</i>					PS
	(b)	The Fine field is an example of a <i>real</i> data type. Explain what is meant by a “real” data type.					1
DB 2.1		<i>A number that may have a fractional/decimal part.</i>					KU
4.	Describe the difference between <i>data</i> and <i>information</i> .					2	
UI 1.1	<ul style="list-style-type: none">• <i>Data is raw (unprocessed) facts and figures (1 mark)</i>• <i>Information is data that is given in context so that it has meaning (1 mark)</i>					KU	
5.	State one offence made illegal by the Computer Misuse Act (1990).					1	
UI 4.2	<i>Any one of:</i> <ul style="list-style-type: none">• <i>Unauthorised access to computer material</i>• <i>Unauthorised access with intent to commit or facilitate commission of further offences</i>• <i>Unauthorised modification of computer material</i>• <i>Computer Hacking</i>• <i>Spreading computer viruses</i>					KU	


Question

Marks

6.	(a)	State the most appropriate type of application software to create the accounts shown below:	1
			
UI 3.1		Financial software	PS
	(b)	Describe a personal use of <i>Reference</i> software.	1
UI 3.1		Any personal use eg looking up a dictionary to find the spelling of a word etc	KU
7.		Customers and retailers are both involved with online shopping.	
	(a)	Describe one advantage to a customer of online shopping.	1
UI 4.1		Any one of: <ul style="list-style-type: none"> Wider choice of goods You can search for the cheapest price online Can have goods delivered to your home Can shop at a time of your own choice as they are open 24 hours a day 	KU
	(b)	Describe one disadvantage to a retailer of online shopping.	1
UI 4.3		Any one of: <ul style="list-style-type: none"> High rates of goods returned Must spend money on website development 	PS

Question		Marks
8.	Describe the role of a <i>knowledge worker</i> in an organisation.	1
UI 4.1	<i>A knowledge worker is someone who adds value by processing existing information to create new information.</i>	KU
	Total for Section I	15

[END OF SECTION I]

	<div>SECTION II</div> <div>Attempt ALL questions in this section</div>																										
9.	SunnyDays is a travel agency with branches throughout the UK. They offer 3, 7 or 14 night holidays to destinations all over the world. Below is an example of some information held by SunnyDays:																										
	<div><div></div><div><div>SunnyDays</div><div><div>Branch ID :179LDN</div><div>Location :London</div><div>Address :258 Oxford Street</div><div>Phone No :0191 569 8745</div></div></div></div> <div><table><tr><th>Holiday No</th><th>Customer Name</th><th>Destination</th><th>Departure Date</th><th>Duration</th><th>Price</th></tr><tr><td>121</td><td>Mr McNeill</td><td>Barbados</td><td>20/09/2012</td><td>7</td><td>£4000</td></tr><tr><td>666</td><td>Mrs Grey</td><td>Rome</td><td>25/09/2013</td><td>3</td><td>£520</td></tr><tr><td>999</td><td>Mr Price</td><td>Australia</td><td>01/10/2013</td><td>14</td><td>£7890</td></tr></table></div>			Holiday No	Customer Name	Destination	Departure Date	Duration	Price	121	Mr McNeill	Barbados	20/09/2012	7	£4000	666	Mrs Grey	Rome	25/09/2013	3	£520	999	Mr Price	Australia	01/10/2013	14	£7890
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	(a)	Identify and remove the multi-valued fields from the above table and represent the data as two entities with suitable names. Clearly identify all primary and foreign keys.	7																								
DB 4.3	Branch	<div><div><div><u>Branch ID</u></div><div>Location</div><div>Address</div><div>Phone No</div></div><div><div>1 mark for Branch table name</div><div>1 mark for all correct attributes in Branch</div><div>1 mark for <u>Branch ID</u> as PK</div><div>1 mark for Holiday table name</div><div>1 mark for all correct attributes in Holiday</div><div>1 mark for <u>Holiday No</u> as PK</div><div>1 mark for Branch ID as FK</div></div></div> <div><div><div><u>Holiday No</u></div><div>Customer Name</div><div>Destination</div><div>Departure Date</div><div>Duration</div><div>Price</div><div>Branch ID*</div></div></div>	PS																								
	(b)	Describe one validation check that would be appropriate for the above data. Your answer should include the field name and suitable validation check.	2																								
DB 3.1		<div>Any one of:</div> <div><div>Duration – Restricted choice (3,7,14)</div><div>BranchID or Holiday No – presence check</div></div>	PS																								

Question
Marks

10.	Naz runs a shop that sells mobile phones. He is considering introducing a computerised <i>information system</i> .		
	(a)	Explain what is meant by the term “information system”.	1
UI 2.1		<i>A system that is used to process (or manage) information.</i>	KU
	(b)	Naz wishes to store the personal details of his customers.	
	(i)	State the legislation that aims to prevent companies misusing personal information.	1
UI 4.2		<i>Data Protection Act</i>	KU
	(ii)	Describe what this legislation requires Naz to do before storing any personal information.	1
UI 4.2		<i>Register with the office for the Information Commissioner.</i>	KU
	(c)	Naz has been advised that he should have a <i>backup strategy</i> for his information system.	
	(i)	Explain why it is important to have a backup strategy.	1
UI 2.3		<i>Any one of:</i> <ul style="list-style-type: none"> <i>To make sure that he does not lose important data in the event of loss or accidental damage to his system</i> <i>To ensure that he can recover any lost data</i> 	KU
	(ii)	State one other information management strategy that Naz should consider implementing.	1
UI 2.3		<i>Any one of:</i> <ul style="list-style-type: none"> <i>Network strategy</i> <i>Security strategy</i> <i>Software strategy</i> <i>(also accept upgrade strategy)</i> 	KU

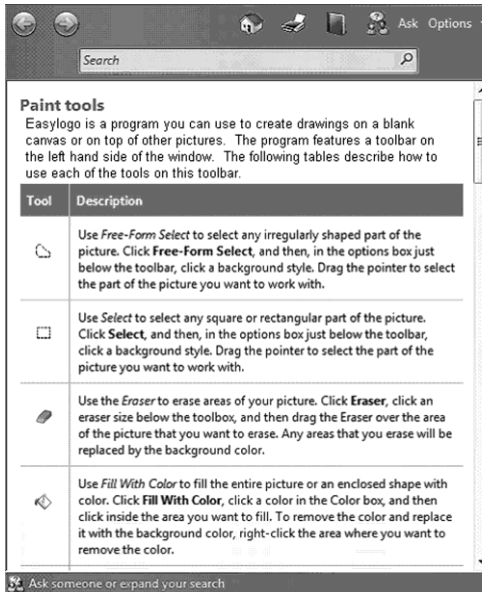
Question	Marks
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Marks

	(d)	Having implemented his information system, he produces the following table:				
	A	B	C	D	E	
1	Sales					
2	Product	Stock Level	Sold	Price	Income	
3	Galaxy	250	12	£80.00	=C3*D3	
4	Curve	380	3	£120.00		
5	J-Phone	500	123	£200.00		
6	NN8	100	55	£60.00		
7	Cookie	300	165	£39.99		
		(i)	A formula was entered into cell E3. State the <i>operation</i> that could efficiently enter a similar formula into cells E4 to E7.			1
UI 3.3			Any one of: <ul style="list-style-type: none"> • <i>Replication</i> • <i>Fill Down</i> 			PS
		(ii)	Identify two <i>formatting functions</i> that have been used in the above table.			2
UI 3.3			Any two of: <ul style="list-style-type: none"> • <i>Currency/fixed number of decimal places</i> • <i>Bold/italic</i> • <i>Font Size change</i> • <i>Row height altered</i> • <i>Alignment changed</i> 			PS
	(e)	After <i>gathering</i> the sales figures, the total sales are then calculated, <i>stored</i> and <i>output</i> .				1
		Name the function of the organisational information system that is being used when the total sales are calculated.				
UI 2.2		<i>Processing (Information)</i>				PS
	(f)	Two implications of introducing the new information system are <i>increased productivity</i> and <i>increased profitability</i> .				
UI 4.3		(i)	Explain what is meant by increased productivity.			1
			Any one of: <ul style="list-style-type: none"> • <i>More work carried out by same number of staff</i> • <i>Same amount of work done in less time</i> 			KU
UI 4.3		(ii)	Explain what is meant by increased profitability.			1
			<i>Naz can make more money</i>			KU

Question

Marks

11.	Amy works in the graphics department of WebEasy and has been given the task of creating a company logo.		
	(a)	<p>Before starting, Amy must choose a graphics package to create the logo. She has the choice of Easylogo or Simply Draw.</p> <p>State two features Amy could use to evaluate which package was more appropriate for creating the logo.</p>	2
UI 3.4		<p>Any two of:</p> <ul style="list-style-type: none"> • Range of data objects • Range of operations • Formatting functions available • HCI • Ease of Use • Online help • Online tutorial 	KU
	(b)	<p>At the bottom of the logo, Amy puts “© WebEasy 2012”. This indicates that WebEasy owns the copyright to the logo.</p> <p>Explain why WebEasy have shown that they own the copyright.</p>	1
UI 4.2		<i>No-one can use/copy the logo without their permission or paying them.</i>	PS
	(c)	<p>While creating the logo, Amy finds the following information screen useful:</p>  <p>State the name given to this type of information screen.</p>	1
UI 3.4		<i>Online help</i>	PS

Question

Marks

12.	The University of Perthshire offers revision courses to help pupils prepare for exams. The data is held in two tables as follows: COURSE(<u>Course ID</u> , Title, Room, Lecturer) PUPIL(<u>Pupil ID</u> , First Name, Surname, School, Contact Number, Course ID*)																																																																																			
	(a)	Explain why the field Course ID is included in the PUPIL table.		1																																																																																
DB 3.1		Any one of: <ul style="list-style-type: none">As a foreign keyto link the tables together		PS																																																																																
	(b)	State the <i>one-to-many</i> relationship that exists in the tables above.		1																																																																																
DB 4.2		ONE course has MANY pupils		PS																																																																																
	(c)	The University produces a <i>report</i> that shows all the pupils studying Course 101.																																																																																		
	<table><tr><th colspan="5">Course 101 Report</th></tr><tr><th>Course ID</th><th>First Name</th><th>Surname</th><th>Contact Number</th><th>School</th></tr><tr><td>101</td><td>Hamza</td><td>Ali</td><td>01738 945632</td><td>Strathallen</td></tr><tr><td>101</td><td>Amna</td><td>Ishaq</td><td>01738 869795</td><td>Strathallen</td></tr><tr><td>101</td><td>Conor</td><td>Johnston</td><td>01738 963258</td><td>Strathallen</td></tr><tr><td>101</td><td>Pulvisha</td><td>Ahmed</td><td>0141 589 1973</td><td>Smithycroft</td></tr><tr><td>101</td><td>James</td><td>Borland</td><td>0141 589 4789</td><td>Smithycroft</td></tr><tr><td>101</td><td>Elaine</td><td>Coyle</td><td>0141 589 6321</td><td>Smithycroft</td></tr><tr><td>101</td><td>Kieran</td><td>Henaghan</td><td>0141 589 6578</td><td>Smithycroft</td></tr><tr><td>101</td><td>Daniel</td><td>McFadden</td><td>0141 589 9632</td><td>Smithycroft</td></tr><tr><td>101</td><td>Qassim</td><td>Mohammed</td><td>0141 589 6739</td><td>Smithycroft</td></tr><tr><td>101</td><td>Louis</td><td>Ruddy</td><td>0141 589 6791</td><td>Smithycroft</td></tr><tr><td>101</td><td>Haider</td><td>Ahmad</td><td>01699 745632</td><td>Kilgraston</td></tr><tr><td>101</td><td>Thomas</td><td>MacKay</td><td>01699 461325</td><td>Kilgraston</td></tr><tr><td>101</td><td>Cain</td><td>Thomson</td><td>01699 879658</td><td>Kilgraston</td></tr><tr><td>101</td><td>Patrick</td><td>Waddle</td><td>01699 846310</td><td>Kilgraston</td></tr></table>				Course 101 Report					Course ID	First Name	Surname	Contact Number	School	101	Hamza	Ali	01738 945632	Strathallen	101	Amna	Ishaq	01738 869795	Strathallen	101	Conor	Johnston	01738 963258	Strathallen	101	Pulvisha	Ahmed	0141 589 1973	Smithycroft	101	James	Borland	0141 589 4789	Smithycroft	101	Elaine	Coyle	0141 589 6321	Smithycroft	101	Kieran	Henaghan	0141 589 6578	Smithycroft	101	Daniel	McFadden	0141 589 9632	Smithycroft	101	Qassim	Mohammed	0141 589 6739	Smithycroft	101	Louis	Ruddy	0141 589 6791	Smithycroft	101	Haider	Ahmad	01699 745632	Kilgraston	101	Thomas	MacKay	01699 461325	Kilgraston	101	Cain	Thomson	01699 879658	Kilgraston	101	Patrick	Waddle	01699 846310	Kilgraston
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	(i)	Describe what is meant by a “report”.		1																																																																																
DB 5.3		<ul style="list-style-type: none">Formatted /Printed output from a database		KU																																																																																
	(ii)	Describe how the Pupil table was searched and sorted to provide the information for the above report.		3																																																																																
DB 5.2		<ul style="list-style-type: none">Search for Course ID = 101 (1 mark)Sort on school in Descending order (1 mark)Sort on Surname in Ascending order (1 mark)		PS																																																																																
		Total for Section II		30																																																																																

[END OF SECTION II]

Question

Marks

	SECTION III PART A – Applied Multimedia Attempt ALL questions in this section		
13.	A business uses a multimedia presentation to introduce a new range of smartphone products to sales staff.		
	(a)	State one other use of multimedia in business.	1
AM 1.1		Any one of: <ul style="list-style-type: none"> • Advertising • Selling products • E-commerce 	KU
	(b)	The presentation contains basic information about Smartphones. Two versions of the information have been created.	

Version
1*Smartphone Basics*

A smartphone is a handheld device that can provide wireless voice communications along with support for other applications. Data applications include messaging (both text and multimedia), e-mail, audio players, and Web surfing via a Graphical User Interface (GUI)-based browser.

Another feature of a smartphone is a built-in camera for taking snapshots, with some smartphones able to capture video clips. Another important feature is docking with a PC for uploading and downloading data.

An important function of office applications is the capability of synchronizing data.

Version
2**Smartphone Basics****Main Uses**

A handheld device providing wireless voice communications and other applications such as:

- text messaging
- multimedia messaging
- audio player
- email
- web surfing

Other features

A number of other features are often available such as:

- built-in camera for snapshots
- ability to capture video clips
- docking with a PC for uploading and downloading data
- capability of synchronizing data entries

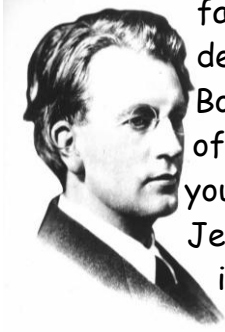
Question				Marks
		(i)	Identify two general principles of text design that have been applied in Version 2.	2
AM 4.2			Any two of: <ul style="list-style-type: none"> Limited quantity of text Choice of font to make it more readable Use of lists / bullet points 	PS
		(ii)	Name the data object used to hold the information in this presentation.	1
UI 3.4			Any one of: <ul style="list-style-type: none"> Slide Text frame 	PS
14.	A museum wishes to introduce interactive multimedia information points about Scottish inventors. The museum commissions ScoMM, a multimedia development company to create the information points.			
	(a)	ScoMM appoint a project manager for the museum project. Describe one task carried out by a project manager.		1
AM 5.3			Any one of: <ul style="list-style-type: none"> Coordinates team members Deals with museum to ensure they are happy with the design and final product Controls budget Controls timescale Allocates tasks to other members of the team 	KU
	(b)	A project specification is prepared which includes details of the <i>delivery media, purpose</i> and <i>content</i> of the information points.		
		(i)	Name one other aspect that should be included in the project specification.	1
AM 2.1			Any one of: <ul style="list-style-type: none"> Audience Budget Timescale 	KU
		(ii)	State the most appropriate delivery media for these information points.	1
AM 1.2			Kiosk	PS

Question
Marks

	(c)	One of the inventors to be included in the exhibition is John Logie Baird. Here is part of a timeline for his life:	
		<div style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> 1888 Born in Helensburgh, Scotland </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> 1924 Transmits moving silhouette images across lab </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> 1926 Demonstrates transmission to Royal Institute </div> <div style="border: 1px solid black; padding: 5px;"> 1928 Beams TV image from England to United States </div> </div>	
		(i) State the type of navigation structure most suitable to show the events in his life from beginning to end.	1
AM 3.1		<i>Linear</i>	PS
		(ii) Justify your answer to part (i)	1
AM 3.1		<i>Suitable to view events in sequence</i>	PS

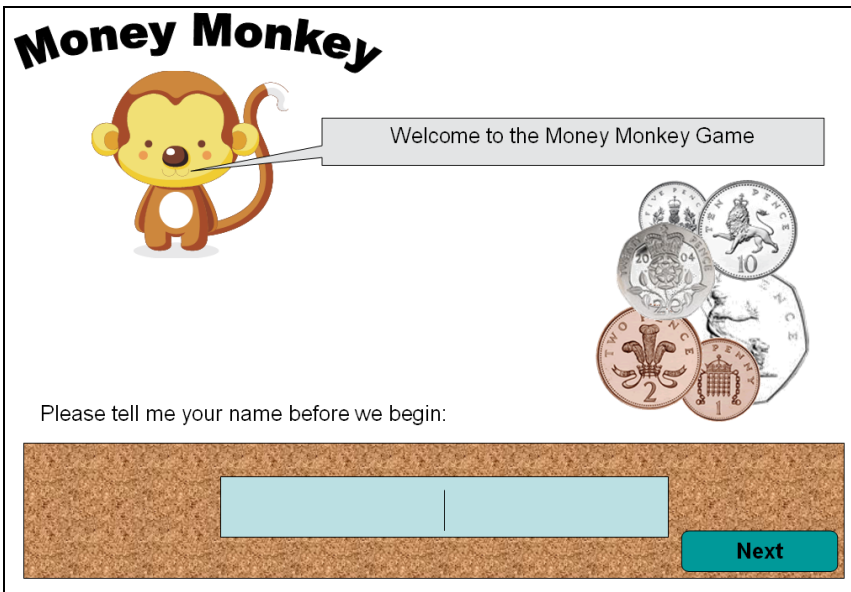
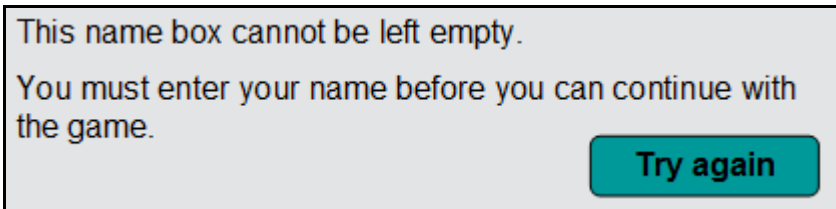
Question

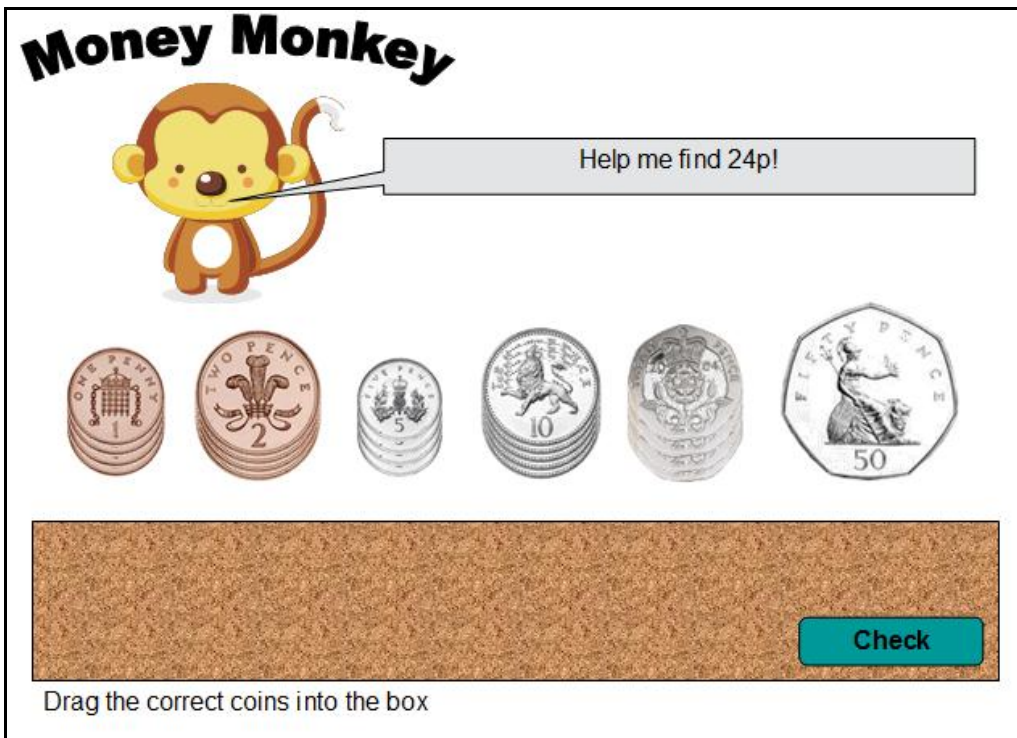
Marks

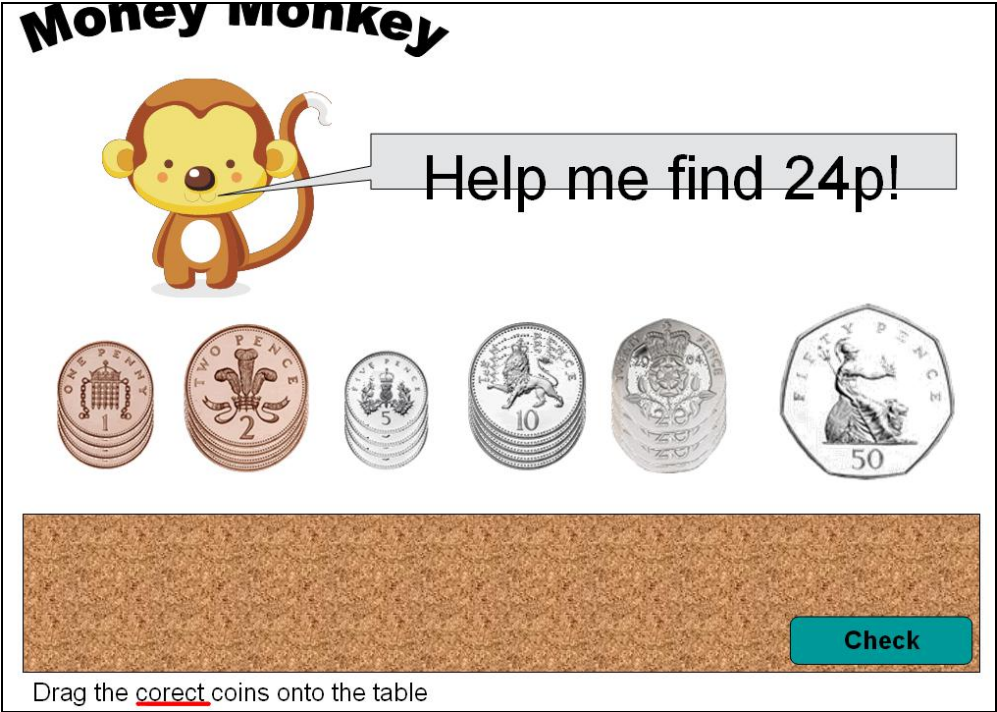
	Another screen will contain old scanned photographs, like the one shown below about John Logie Baird.			
	<p>John Logie Baird was an engineer and inventor. Known as "The Father of Television", he is most famous for being the first person to demonstrate a working television. Born in Helensburgh on the west coast of Scotland, John was the fourth and youngest child of the Rev John and Jessie Baird. He showed early signs of ingenuity by setting up a telephone exchange to connect his house to those of his friends nearby.</p>  <p>John Logie Baird</p>			
	(d)	(i)	Identify two graphic design principles that have been incorporated in this screen.	2
AM 4.3			<ul style="list-style-type: none"> • <i>Text wrap (1 mark)</i> • <i>Caption (1 mark)</i> 	PS
		(ii)	Explain how the resolution of the scanned image will affect the file size and clarity of the graphic.	2
AM6.1			<i>Higher the resolution, the larger the file size (1 mark)</i> <i>Higher the resolution, the clearer the image quality (1 mark)</i>	KU
		(iii)	The image of John Logie Baird is an <i>anchor</i> . Explain what is meant by the term 'anchor' in this situation.	1
AM 6.3			<i>It is the part the user clicks on to activate a link to another screen</i>	KU
	(e)	Before the information point is introduced into the museum, an evaluation is carried out to ensure it is <i>fit for purpose</i> . Describe one technique the museum could use to evaluate the new system.		1
AM 9.1		Any one of: <ul style="list-style-type: none"> • <i>Compare product to specification</i> • <i>Focus Group</i> • <i>User Questionnaire</i> • <i>User Observation.</i> 		PS

Question

Marks

15.	Money Monkey is an interactive game which helps young children learn about money.		
	Before playing the game, the user is asked to enter their name.		
			
	<p>If they do not type a name, the following screen is displayed:</p> 		
	(a)	Name the feature used in the program that meant this message was displayed.	1
DB 3.1		<p>Any one of</p> <ul style="list-style-type: none"> • Validation • Presence check 	PS

	When playing the game, the user sees the following screen:			
				
	(b)	(i)	State the type of user interface being used above.	1
AM 3.3			<i>Direct Manipulation (Graphical User Interface/GUI)</i>	PS
		(ii)	Explain why this type of user interface is suitable for this application.	1
AM 3.3			<i>Any one of:</i> <ul style="list-style-type: none"> • <i>Easy to use for young children</i> • <i>No need to learn commands or read menus</i> • <i>Intuitive interaction</i> 	PS
	(c)	Background music is played during the game. Suggest one other use of audio in this game.		1
AM 4.4			<i>Any one of:</i> <ul style="list-style-type: none"> • <i>Voice over to read the question aloud for young children</i> • <i>Clapping sound effect when 'check' is clicked and answer is correct</i> • <i>Clinking of coins when dragged onto the table</i> 	PS

Question	Marks		
	(d)	(i) State the most appropriate type of software for creating the Money Monkey game.	1
AM 5.1		<i>Authoring (icon based or scripting)</i>	PS
		(ii) Give a reason for your answer to part (i).	1
AM 5.1		Any one of: <ul style="list-style-type: none"> • Applications requires programming to set up questions and check answers • Allows for creation of interaction easily • Contains icons/scripts to check answer 	PS
	(e)	During the development of the game, screen testing is carried out.	
			
		Describe three problems on the screen shown above that would be identified during screen testing.	2
AM 7.2		<ul style="list-style-type: none"> • Incorrect spelling of 'correct' should be identified by spell check • Words spoken by Monkey do not fit inside speech bubble • Heading not placed accurately on screen • Text instruction at bottom is too small and should be more obviously positioned <p>Any 3 errors identified = 2 marks Any 2 errors identified = 1 mark One or zero errors identified = 0 marks</p>	PS

Question**Marks**

	(f)	The Money Monkey game is distributed with <i>User Instructions</i> .	
		Describe two items that should be contained in the User Instructions.	2
AM 8.1		<i>Any two of:</i> <ul style="list-style-type: none">• <i>Instructions how to install the game</i>• <i>Tutorial/demonstration how to play</i>• <i>Explanation of each option in the game</i>	KU
		Total for Section III – Part A	25

[END OF SECTION III – PART A]

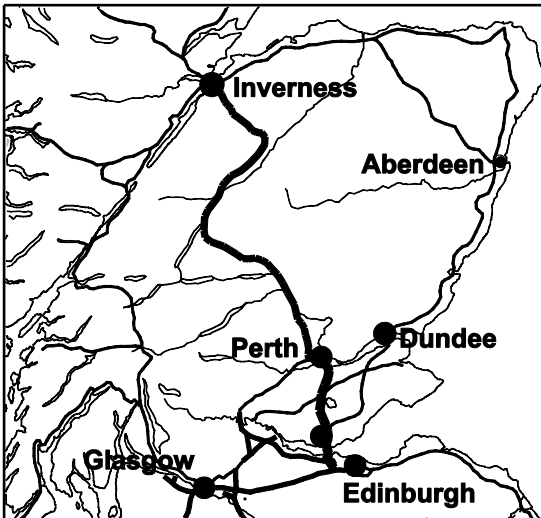


Question

Marks

	SECTION III PART B – Expert Systems Attempt ALL questions in this section																		
16.	Expert systems deal with knowledge.																		
	(a)	Explain the difference between <i>information</i> and <i>knowledge</i> .	2																
UIES 1.2		<ul style="list-style-type: none">• <i>Information is facts that are in context. (1 mark)</i>• <i>Knowledge is new facts derived from known facts by applying inference rules. (1 mark)</i>		KU															
	(b)	An expert system is often created using an <i>expert system shell</i> . Describe two features of an expert system shell.	2																
ES 1.1.2		<ul style="list-style-type: none">• <i>Contains no facts and rules in its knowledge base / (empty knowledge base)(1 mark)</i>• <i>Has built in user interface and/or has built in inference engine (1 mark)</i>		KU															
17.	A router manufacturer wishes to develop an expert system to determine the nature of problems with internet connections. Here is some of the knowledge to be included in the system. “Each router has a DSL light and an Internet light. If the DSL light and the Internet light are both on green, then the ADSL filter needs to be checked. If the DSL light is green and the Internet light is flashing, then check the router settings. However if the DSL light is green, and the Internet light is off, then check the username and password are entered correctly. If the DSL light is flashing and the internet light is off, then the service has not yet been activated.” Represent the knowledge about the internet connection problems as a factor table.			4															
ES 2.2	<table><tr><td><i>DSL Light</i></td><td><i>Internet Light</i></td><td><i>Action</i></td></tr><tr><td><i>Green</i></td><td><i>Green</i></td><td><i>Check ADSL filter</i></td></tr><tr><td><i>Green</i></td><td><i>Flashing</i></td><td><i>Check router settings</i></td></tr><tr><td><i>Green</i></td><td><i>Off</i></td><td><i>Check username and password</i></td></tr><tr><td><i>Flashing</i></td><td><i>Off</i></td><td><i>Service not activated</i></td></tr></table> <i>Appropriate headings – 1 mark</i> <i>4 rows correct – 3 marks</i> <i>2/3 rows correct – 2 marks</i> <i>1 row correct – 1 mark</i>			<i>DSL Light</i>	<i>Internet Light</i>	<i>Action</i>	<i>Green</i>	<i>Green</i>	<i>Check ADSL filter</i>	<i>Green</i>	<i>Flashing</i>	<i>Check router settings</i>	<i>Green</i>	<i>Off</i>	<i>Check username and password</i>	<i>Flashing</i>	<i>Off</i>	<i>Service not activated</i>	PS
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<i>Flashing</i>	<i>Off</i>	<i>Service not activated</i>																	

Question
Marks

18.	<p>Scott uses an expert system to find the route to drive from Inverness to Edinburgh.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: left;"> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="background-color: green; color: white; border-radius: 50%; padding: 2px 5px; font-weight: bold; font-size: 0.8em;">START</div> <div style="margin-left: 5px;">Departure</div> </div> <div style="border: 1px solid gray; padding: 2px; margin-bottom: 5px;">address, town, postcode</div> </div> <div style="text-align: left;"> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="background-color: red; color: white; border-radius: 50%; padding: 2px 5px; font-weight: bold; font-size: 0.8em;">STOP</div> <div style="margin-left: 5px;">Destination</div> </div> <div style="border: 1px solid gray; padding: 2px; margin-bottom: 5px;">address, town, postcode</div> </div> </div> <div style="text-align: right; margin-top: 20px;"> <div style="background-color: yellow; border: 2px solid black; padding: 5px; font-weight: bold; font-size: 1.1em;">Calculate Your Route</div> </div> </div>		
	(a)	Name the component of the expert system responsible for displaying the screen above.	1
ES 1.3		<i>User Interface</i>	PS
	(b)	State the category of this expert system.	1
ES 1.4		<i>Planning</i>	PS

	<p>During the development of the expert system, two methods of displaying the route were included.</p> <p>Method 1: Route Map</p> 	
	<p>Method 2: Route Instructions</p> <div>  Depart: Leave Inverness centre <ul style="list-style-type: none"> Continue along A82 At the roundabout, take 3rd exit and continue along A9 Near Perth, at the roundabout, take 2nd exit and continue along M80 Take A90  Destination: Arrive Edinburgh </div>	
(c)	State one reason for including a variety of methods to present the conclusion in this expert system.	1
	<p>Any one of:</p> <ul style="list-style-type: none"> User can select most appropriate method to suit their needs Method 1 provides visual representation of complete route for driver Method 2 provides more detailed road information to be followed at each stage of route 	PS

Question**Marks**

19.	<p>Ski resorts use a rating system to indicate the difficulty of ski runs. There are four ratings used – Green(easy), Blue(beginner), Red(intermediate) and Black(expert).</p> <p>An expert system is being developed to help skiers decide which ski runs to try during their holiday.</p> <p>The factor table below shows some of the knowledge in the expert system:</p>																																																		
	<table border="1"> <thead> <tr> <th>Rating</th><th>Length</th><th>Mountain Area</th><th>Name of Ski Run</th></tr> </thead> <tbody> <tr> <td>Green</td><td>Short</td><td>Les Brevieres</td><td>Davie</td></tr> <tr> <td>Green</td><td>Medium</td><td>Tignes</td><td>Lavachet</td></tr> <tr> <td>Blue</td><td>Very long</td><td>Les Boisses</td><td>Mélèzes</td></tr> <tr> <td>Blue</td><td>Long</td><td>Val Claret</td><td>Piste H</td></tr> <tr> <td>Blue</td><td>Short</td><td>Tignes</td><td>Petit Col</td></tr> <tr> <td>Red</td><td>Short</td><td>Tignes</td><td>Saxifrage</td></tr> <tr> <td>Red</td><td>Long</td><td>Tignes</td><td>Bleuets</td></tr> <tr> <td>Red</td><td>Long</td><td>Val Claret</td><td>Double M</td></tr> <tr> <td>Red</td><td>Short</td><td>Tignes</td><td>Crocus</td></tr> <tr> <td>Black</td><td>Very long</td><td>Les Brevieres</td><td>Sache</td></tr> <tr> <td>Black</td><td>Medium</td><td>Grand Motte</td><td>Descente</td></tr> </tbody> </table>		Rating	Length	Mountain Area	Name of Ski Run	Green	Short	Les Brevieres	Davie	Green	Medium	Tignes	Lavachet	Blue	Very long	Les Boisses	Mélèzes	Blue	Long	Val Claret	Piste H	Blue	Short	Tignes	Petit Col	Red	Short	Tignes	Saxifrage	Red	Long	Tignes	Bleuets	Red	Long	Val Claret	Double M	Red	Short	Tignes	Crocus	Black	Very long	Les Brevieres	Sache	Black	Medium	Grand Motte	Descente	
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	(a)	Identify the stage of the expert system development when a factor table is created.	1																																																
ES 3.2		<i>Knowledge representation</i>	KU																																																

Question
Marks

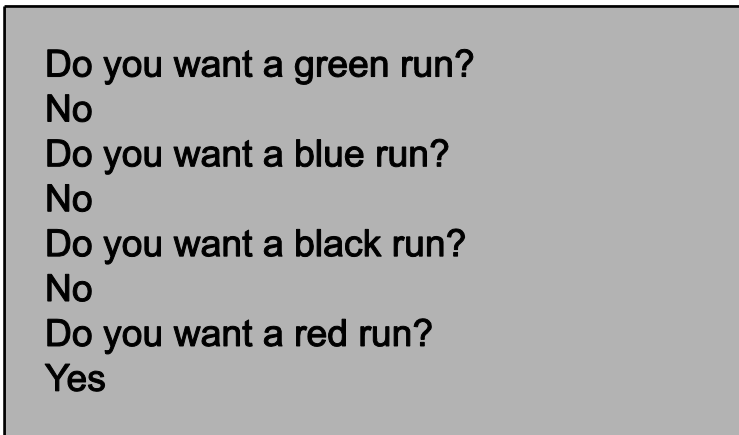
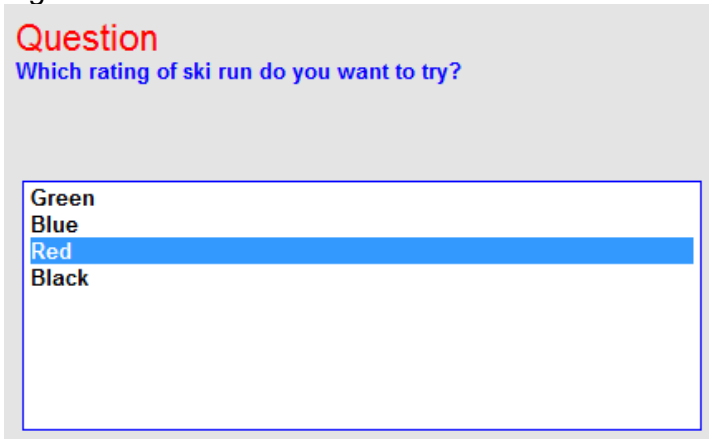
	(b)	Production rules are written for the ski run expert system.				
		(i)	Identify the method of inferencing that should be used to write the production rules for this system.	1		
ES 2.3.2			<i>Forward chaining</i>	PS		
		(ii)	Give a reason for your answer in part (i).	1		
			<i>Need to gather information from the skier about preferences to suggest a ski run that suits their needs.</i>	PS		
		(iii)	Using your chosen method of inferencing, write the rule that will recommend they try the ski run called Descente.	4		
ES 4.3	<table><tr><td><i>Using Forward Chaining</i> <i>IF Rating IS Black AND Length IS Medium AND Mountain Area IS Grande Motte THEN Name of Ski Run IS Descente.</i></td><td><i>Using Backward chaining (if answer to b(i))</i> <i>ADVISE Name of Ski Run IS Descente IF Rating IS Black AND Length IS Medium AND Mountain Area IS Grande Motte.</i></td></tr></table>			<i>Using Forward Chaining</i> <i>IF Rating IS Black AND Length IS Medium AND Mountain Area IS Grande Motte THEN Name of Ski Run IS Descente.</i>	<i>Using Backward chaining (if answer to b(i))</i> <i>ADVISE Name of Ski Run IS Descente IF Rating IS Black AND Length IS Medium AND Mountain Area IS Grande Motte.</i>	PS
<i>Using Forward Chaining</i> <i>IF Rating IS Black AND Length IS Medium AND Mountain Area IS Grande Motte THEN Name of Ski Run IS Descente.</i>	<i>Using Backward chaining (if answer to b(i))</i> <i>ADVISE Name of Ski Run IS Descente IF Rating IS Black AND Length IS Medium AND Mountain Area IS Grande Motte.</i>					
	(c)	Explain how the domain expert is involved during the testing of this system.		1		
ES 3.3		<i>He will check that the ski runs recommended during testing consultation are correct.</i>		PS		

Question
Marks

	(d)	After a test consultation the following screen is displayed. <div style="border: 1px solid black; padding: 10px; background-color: #e0f2f7; margin: 10px auto; width: 80%;"> <p style="font-size: 1.2em; margin: 0;">You are advised to try the ski run called Lavachet</p> <div style="float: right; border: 1px solid black; border-radius: 5px; padding: 5px 10px; margin-top: 10px;"> <p style="color: red; margin: 0;">Explain</p> </div> </div> <p>Describe the purpose of the Explain button on this screen.</p>	1
ES 3.4		<i>Explains how the conclusion of the Lavachet run was reached</i>	KU
	(e)	When the system is completed, a skier uses it to find a short red run in Tignes.	
	(i)	State all the advice the completed system will give the skier	2
ES 3.2		<i>Saxifrage and Crocus (1 mark each)</i>	PS
	(ii)	If the system was implemented in a database instead of an expert system, which feature would be used to find a short red run in Tignes?	1
DB 5.2		Any one from <ul style="list-style-type: none"> • Query • Search 	KU

Question


Marks

		During the consultation the following screen is displayed:	
			
	(iii)	Design a structured question that would be a more efficient method of getting the same information. You may use a diagram in your answer if you wish.	2
ES4.4		<p><i>Only one question should be asked (1 mark)</i> <i>Only one response required which allows all 4 answers as shown in the question (1 mark)</i> e.g.</p> 	PS
		Total for Section III – Part B	25

[END OF SECTION III – PART B]

Question

Marks

	<p align="center">SECTION III PART C – The Internet Attempt ALL questions in this section</p>		
20.	<p>Faith uses the MySearches search engine to find information about martial arts clubs.</p> 		
	(a)	<p>She wishes to find a martial arts club in the Angus area that does not meet on a Thursday.</p> <p>State a Boolean search that would find this information.</p>	3
INT 2.4		<ul style="list-style-type: none"> • <u>“martial arts”</u> <u>AND Angus</u> <u>NOT Thursday</u> • <u>“martial arts”</u> <u>+ Angus</u> <u>– Thursday</u> <p><i>1 mark each underlined part</i></p>	PS
	(b)	<p>Faith would like to watch some martial arts video clips.</p> <p>Identify the advanced search feature from MySearches, shown above, which is most suitable for this search.</p>	1
INT 2.5		<i>Search by File Type</i>	PS
	(c)	Identify the feature from MySearches, shown above, that would most likely have been created using the scripting tool.	1
INT 4.1		<i>Submit button</i>	PS

Question**Marks**

	(d)	Faith downloads a martial arts video. Soon afterwards, Faith thinks that her computer may have a virus. The anti-virus software she has installed has not given her any warnings.	
	(i)	Describe one symptom of virus infection that makes Faith think that her computer has a virus.	1
INT 2.6		<i>Any one of:</i> <ul style="list-style-type: none">• <i>Computer slows down</i>• <i>Computer keeps rebooting</i>• <i>Files deleted</i>• <i>Any other acceptable answer</i>	PS
	(ii)	Suggest one reason why the anti-virus software may not have notified Faith that her computer has a virus.	1
INT 2.6		<i>Any one of:</i> <ul style="list-style-type: none">• <i>Virus software not been updated recently</i>• <i>Virus was created after her anti-virus software was created</i>	PS

Question**Marks**

21.	Sportland is a sports store which is found in many shopping centres.		
	(a)	Sportland has decided to expand its business through the use of <i>e-commerce</i> .	
		(i) Explain what is meant by the term "e-commerce".	1
UI 4.1		<i>The buying and selling of goods/services using the Internet.</i>	KU
		(ii) Describe a social implication which has risen from the increased use of e-commerce.	1
INT 1.3.1		<i>Any one of:</i> <ul style="list-style-type: none">• <i>Many high street stores are going out of business (particularly in small towns)</i>• <i>Not always available to the people who are most in need due to their lack of computers and Internet connections</i>• <i>It is possible to shop at a time convenient to you as it is available 24 hours a day 7 days a week.</i>	KU

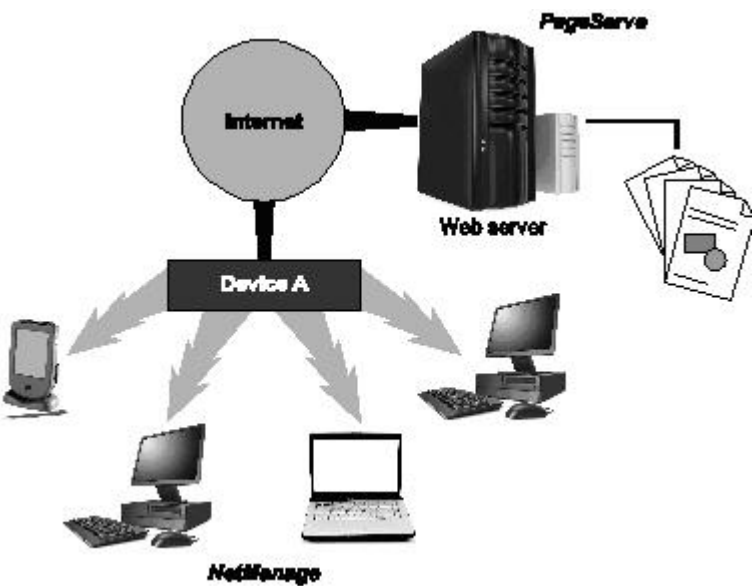
	(b)	<p>Daniel designs Sportland's website file structure as shown below:</p> <pre> graph TD Sportland[Sportland] --> WaterSports[Water Sports] Sportland --> ExtremeSports[Extreme Sports] WaterSports --> Swimming[Swimming] WaterSports --> Canoeing[Canoeing] Swimming --> swim[swim.htm] Swimming --> costume[costume.jpg] Swimming --> cap[cap.gif] Swimming --> olympic[olympic.avi] ExtremeSports --> Skiing[Skiing] ExtremeSports --> Skateboarding[Skateboarding] Skiing --> ski[ski.htm] Skiing --> prize[prize.jpg] Skiing --> ski_img[ski.jpg] Skiing --> jump[jump.mov] </pre>	
	(i)	State the type of application software that would be most appropriate for Daniel to create the website.	1
UI 2.1		<i>Web Authoring</i>	PS
	(ii)	State the type of page addressing that Daniel should use to include the file costume.jpg on the swim.htm page.	1
INT 4.2		<i>Relative</i>	PS
	(iii)	<p>Daniel creates a link between swim.htm and ski.htm.</p> <p>State the feature of the software package he would use to create the link.</p>	1
INT 4.1		<i>Hyperlink Tool</i>	KU

Question

Marks

	(c)	Sportland decide to add extra functionality to their website.		
		(i)	<p>They wish to give their customers the opportunity to speak to a sales advisor in real-time.</p> <p>State an Internet service that would allow them to do this.</p>	1
INT 2.1			<p>Any one of:</p> <ul style="list-style-type: none"> • <i>Chat</i> • <i>Instant Messaging</i> • <i>Video Conferencing</i> 	PS
		(ii)	Suggest a suitable business use that Sportland could have for e-mail.	1
INT 2.2			<p>Any one of:</p> <ul style="list-style-type: none"> • <i>Communicating with customers regarding orders</i> • <i>Communicating with manufacturers regarding orders</i> • <i>Giving customers details of special offers</i> • <i>Confirming online sales</i> 	PS
	(d)	Some customers are concerned about the security of their bank details when using the Sportland website.		
		(i)	State a development in security software which has made using the website more secure for Sportland's customers.	1
INT 3.1			<p>Any one of:</p> <ul style="list-style-type: none"> • <i>Encryption</i> • <i>Anti-Virus software</i> • <i>Firewalls</i> • <i>Spyware Removal Software</i> 	PS
		(ii)	Describe how the development you suggested in part (i) has led to increased security.	1
INT 3.1			<p>Any one of:</p> <ul style="list-style-type: none"> • <i>Encryption involves encoding data using a secret key.</i> • <i>Anti-Virus software detects and removes/isolates computer viruses.</i> • <i>Firewall check information coming from a network and then either allows it to pass or blocks it depending on the firewalls settings.</i> • <i>Spyware Removal Software detects and removes/isolates spyware.</i> 	KU

Question
Marks

22.	<p>PageServe is an Internet Service Provider (ISP) which provides Internet services to a company called NetManage. A diagram of the connection between PageServe and NetManage is shown below:</p> 		
	(a)	Identify the name of device A from the diagram above.	1
INT 1.1.8		<i>Router</i>	PS
	(b)	PageServe is responsible for NetManage's <i>Internet hosting service</i> .	
	(i)	Explain what is meant by the term "Internet hosting".	1
INT 1.1.1		<i>Internet hosting provides storage for webpages, e-mails and newgroups</i>	KU
	(ii)	State the Internet service which should be used to upload data files onto the web server.	1
INT2.1		<i>File Transfer</i>	KU
	(c)	<p>PageServe store high resolution graphics for use on their customers' webpages.</p> <p>Explain why this will be a problem for computers using a low bandwidth Internet connection.</p>	2
INT 4.3.2		<i>High resolution images have a large file size (1 mark) which make them slow to download (1 mark)</i>	PS

Question

Marks

	(d)	Data sent over a network is divided into packets. A diagram of a packet is shown below: <table border="1"><tr><td>Data</td><td>X</td><td>Destination Address</td></tr></table> Two of the parts that make up a packet are the data and the destination address. Name the part of a packet shown in the diagram as 'X'.		Data	X	Destination Address	1
Data	X	Destination Address					
INT 1.1.2		Source Address		PS			
	(e)	Communication protocols are used to send data between PageServe and NetManage.					
	(i)	Describe what is meant by a communication protocol.		2			
INT 1.2		Protocols are required to establish a set of rules (1 mark) For sending data between computer systems (1 mark)		KU			
	(ii)	State the protocol which is used for downloading web pages.		1			
INT 1.3		Hypertext Transfer Protocol (HTTP)		KU			
		Total for Section III – Part C		25			

[END OF SECTION III – PART C]

[END OF MARKING INSTRUCTIONS]