



# **2014 Information Systems**

## **Higher**

### **Finalised Marking Instructions**

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## Part One: General Marking Principles for Information Systems Higher

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.

- (a) Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader/Principal Assessor. *You can do this by posting a question on the Marking Team forum or by e-mailing/phoning the e-marker Helpline.*
- (b) Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.

### GENERAL MARKING ADVICE: Information Systems Higher

The marking schemes are written to assist in determining the “minimal acceptable answer” rather than listing every possible correct and incorrect answer. The following notes are offered to support Markers in making judgements on candidates’ evidence, and apply to marking both end of unit assessments and course assessments.

- a. Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader/Principal Assessor. You can do this by posting a question on the Marking Team forum or by e-mailing/phoning the emarker Helpline.  
Alternatively, you can refer the issue directly to your Team Leader by checking the ‘Referral’ box on the marking screen.
- b. Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.
- c. Technical terms which have been spelled incorrectly should still be awarded the relevant mark.
- d. In situations where the subsequent part of a question depends on the correct answer to the first part, candidates who answer the first part incorrectly and then go on in the subsequent part of the question to give a correct answer based on their answer to the first part will be awarded the relevant mark for the subsequent part of the question.
- e. In situations where the candidate has achieved the maximum number of marks available without getting to the end of their answer, a marker should award the maximum marks. However, in situations where there is only one correct answer and the candidate has split their answer with a/or an or, then this should not be accepted as a separate response and the marks should not be awarded. For example, if the correct answer for a data type question is date then a response of (date/time) or (date or time) would attract 0 marks as the/and the or combines the answer making it incorrect.

- f. In situations where the candidate writes the correct answer followed by an alternative incorrect answer then this should not be penalised. However, if the candidate writes an incorrect answer followed by a correct alternative answer this should not be awarded the marks. For example if the correct answer to a 1 mark question is written and the candidate includes an alternative incorrect answer such as visual then the following would apply:  
Written (visual) = 1 mark.  
Written/visual = 0 marks (example of combining as in (e) above).  
Visual (written) = 0 marks.

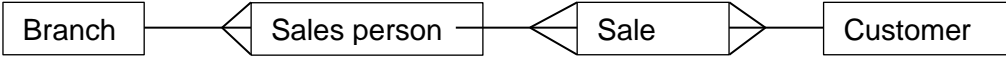
**Part Two: Marking Instructions for each Question**  
**Section I**

Question		Expected Answer(s)	Max Mark	Additional Guidance
1	(a)	You cannot enter a doctor (1 mark) without a patient (1 mark)	2	
1	(b)	It can/may change (1 mark) not unique (1 mark)	2	
1	(c)	Difficult to search/sort (1 mark) for town/ street/post code (1 mark)  Not an atomic field (2 marks)	2	Note: equivalent statement to atomic eg more than one piece of data in a field/attribute. Multi valued should not be accepted as it is not the same as non-atomic.
2		Remove non-key (or transitive) dependencies (2 marks)	2	
3	(a)	A (primary) key made up of more than one attribute/field/column (2 marks)	2	
3	(b)	An attribute with more than one value for an instance or record or occurrence or given value of a primary key (2 marks)	2	
4	(a)	<div style="text-align: center;"> <p>STUDENT                      COURSE</p> </div> <p>1 mark for list of 4 opposite list of 3 1 mark for correct matching</p>	2	Note: Labelling not required for full credit.

Question		Expected Answer(s)	Max Mark	Additional Guidance
4	(b)	Many to many (1 mark)	1	Do not accept any multiple answers
5		<ul style="list-style-type: none"> <li>data about data or structured information about a resource (1 mark)</li> <li>raw/unprocessed facts/figures (1 mark)</li> <li>data with context/structure/meaning or processed data (1 mark)</li> <li>derived from information (1 mark) or example to show this</li> </ul>	4	Knowledge is gained from information plus an explanation is acceptable
6	(a)	<p>sampled because only 100 users were asked (or only Version II users were asked) (1 mark)</p> <p>secondary because it is the results of the survey (1 mark)</p>	2	Do not accept generic definitions – must refer to survey.
6	(b)	aural, written and visual (all three for 2 marks, two for 1 mark)	2	
7	(a)	Goal seek (1 mark)	1	
7	(b)	<p>X = B2 (1 mark)</p> <p>Y = 250,000 (1 mark)</p> <p>Z = B1 (1 mark)</p>	3	Accept £250,000
8		<ul style="list-style-type: none"> <li>any person can obtain <u>requested/specific</u> information from public bodies</li> <li>promoted and enforced by Scottish Information Commissioner</li> <li>exemptions are national security, defence, police investigations and development of government policy</li> <li>do not have to provide already published information</li> </ul> <p>(any 1 bullet for 2 marks)</p>	2	<p>Insist on requested/specific information</p> <p>1 mark for specific example only</p>
9		Diagram of mesh, star, ring or tree (1 mark)	1	Do not accept bus.

**Section II**

Question	Expected Answer(s)	Max Mark	Additional Guidance								
10	<table border="1"> <thead> <tr> <th>UNF</th> <th>1NF</th> <th>2NF</th> <th>3NF</th> </tr> </thead> <tbody> <tr> <td> <u>Product number</u>                      Description                      Part code                      Type                      Quantity                      Part price                      Supplier code                      Supplier                      Supplier address                      Standard order quantity                 </td> <td> <u>Product number</u>                      Description   <u>Part code</u>                      Type                      Quantity                      Part price                      Supplier code                      Supplier                      Supplier address                      Standard order quantity  <u>Product number*</u> </td> <td> <u>Product number</u>                      Description   <u>Part code*</u>  <u>Product number*</u>                      Quantity   <u>Part code</u>                      Type                      Part price                      Supplier code                       Supplier                      Supplier address                      Standard order quantity                 </td> <td> <u>Product number</u>                      Description   <u>Part code*</u>  <u>Product number*</u>                      Quantity   <u>Part code</u>                      Type                      Part price                      Standard order quantity                      Supplier code*   <u>Supplier code</u>                      Supplier                      Supplier address                 </td> </tr> </tbody> </table> <p>There are <b>6 marks</b> for the <b>process</b> and <b>11 marks</b> for the <b>final 3NF</b></p> <p><u>Process</u></p> <p>1NF – 1 mark for creating a second entity including Product No                      1 mark for including <u>all</u> 8 multi-valued attributes shown (ignore extra attributes)</p> <p>2NF – 1 mark for removing Part Code with attributes                      1 mark for leaving a copy of Part Code only behind</p> <p>3NF – 1 mark for removing a non-key dependency provided a PK is not removed with it                      1 mark for leaving a copy of the non-key dependency behind</p> <p><u>Looking only at 3NF</u></p> <p>(4 marks for attributes)</p> <ul style="list-style-type: none"> <li>• 1 mark for each entity having the correct attributes (a misplaced <b>non-PK</b> attribute would only lose 1 mark ie would not lose the mark in both entities (4 marks for Primary Keys)</li> <li>• 2 marks for the compound Primary Key</li> <li>• 1 mark for Part Code as PK</li> <li>• 1 mark for Suppliers Code as PK (3 marks for Foreign Keys)</li> <li>• 1 mark for each correct Foreign Key</li> </ul> <p><i>Only give FK if it links to a singular PK in this case                      FK cannot be a single PK in this case</i></p>	UNF	1NF	2NF	3NF	<u>Product number</u> Description Part code Type Quantity Part price Supplier code Supplier Supplier address Standard order quantity	<u>Product number</u> Description  <u>Part code</u> Type Quantity Part price Supplier code Supplier Supplier address Standard order quantity <u>Product number*</u>	<u>Product number</u> Description  <u>Part code*</u> <u>Product number*</u> Quantity  <u>Part code</u> Type Part price Supplier code  Supplier Supplier address Standard order quantity	<u>Product number</u> Description  <u>Part code*</u> <u>Product number*</u> Quantity  <u>Part code</u> Type Part price Standard order quantity Supplier code*  <u>Supplier code</u> Supplier Supplier address		
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Question		Expected Answer(s)	Max Mark	Additional Guidance
11	(a)	 <ul style="list-style-type: none"> <li>• 2 marks for each correct relationship without an extra relationship</li> <li>• 1 mark for each relation with incorrect cardinality without an extra relationship</li> <li>• 1 mark for each correct relationship with an extra relationship</li> </ul> <p><u>Note:</u> extra relationships should be evenly shared when allocating marks. 9 relationships gets 0 marks even including 3 correct</p>		
11.	(b)	<p>(Entity integrity) not affected (<b>1 mark</b>) as Branch postcode is unique and required (<b>1 mark</b>)</p> <p>(Entity integrity) affected (<b>1 mark</b>) as Customer postcode is not unique for each customer (<b>1 mark</b>)</p>	<b>4</b>	
11	(c)	<p>Lookup (<b>1 mark</b>) only allows values (<b>1 mark</b>) <u>from</u> Sales ID in Salesperson (<b>1 mark</b>)</p>	<b>3</b>	Do not accept a definition of a FK
12	(a)	<p><b>Data processing system</b></p> <ul style="list-style-type: none"> <li>• Produces large amount of data</li> <li>• Transactional/operational/day-to-day</li> </ul> <p><b>Data mining</b></p> <ul style="list-style-type: none"> <li>• Looks for trends</li> <li>• In massive/huge amounts of data</li> <li>• To target advertising/marketing</li> </ul> <p><b>Link between two terms</b></p> <ul style="list-style-type: none"> <li>• Data processing output goes to data warehouse</li> <li>• Data mining uses data processing output/ data warehouse</li> </ul> <p><b>Any 5 bullets for 5 marks</b></p>	<b>5</b>	

Question		Expected Answer(s)	Max Mark	Additional Guidance
12	(b)	<ul style="list-style-type: none"> <li>• Day or Date</li> <li>• Type of backup</li> <li>• Server ID/source</li> <li>• Serial/Version/Barcode/Rotation number</li> <li>• Technician ID/initials (creator of the backup/file)</li> </ul> <p><b>Any bullet 1 mark</b></p> <ul style="list-style-type: none"> <li>• Day or Date + Time <b>(2 marks)</b></li> </ul>	3	
12	(c)	<ul style="list-style-type: none"> <li>• Full backup (with no other type of backup included)</li> <li>• Converted to read only/permanent</li> <li>• Another tape is added each week/month/quarter/year</li> <li>• Clear labelling/organised/categorised</li> <li>• Access is restricted</li> </ul> <p><b>Any 2 bullets for 2 marks</b></p>	2	
12	(d)	<ul style="list-style-type: none"> <li>• Most recent (full) backup</li> <li>• And <u>all</u> subsequent incremental backups</li> </ul> <p><b>Any 2 bullets for 2 marks</b></p>	2	



Question			Expected Answer(s)	Max Mark	Additional Guidance
13	(a)		<p>Ease of locating information</p> <ul style="list-style-type: none"> <li>• Create table of contents for headings.</li> <li>• Create index by marking entries</li> <li>• Add page numbers/title/name – footer/header.</li> </ul> <p>Consistency in appearance</p> <ul style="list-style-type: none"> <li>• Use stylesheet to set fonts (type size, colour)</li> <li>• Use stylesheet to set line spacing/paragraph spacing.</li> <li>• Add drop capitals to each section.</li> </ul> <p>Pagination</p> <ul style="list-style-type: none"> <li>• Page breaks to start new sections</li> <li>• Add page numbers/title/name – footer/header.</li> <li>• Avoid windows and orphans/split paragraphs/remove white space.</li> <li>• Create columns to minimise white space.</li> <li>• Use of margins to control amount of information</li> </ul> <p>Incorporation of graphics</p> <ul style="list-style-type: none"> <li>• Text wrap text around image.</li> <li>• Add a caption.</li> </ul> <p><b>(2 or 0 marks for each description of word processing software for each of the 4 areas)</b></p>	8	<p>Insist on headings</p> <p>Insist on header/footer</p> <p>Insist on stylesheet (not template, house style or master page)</p> <p>Must be a description</p> <p>If no headings – assume the order stated here</p>
13	(b)	(i)	<p>functionality – can the new software do any of the candidate’s answer to part (a) <b>(1 mark)</b></p> <p>Data migration – can the new software open (the file which contains) his research paper or a document he created <b>(1 mark)</b></p>	2	
13	(b)	(ii)	<p>performance, usability, compatibility, reliability, resource requirements, portability, support</p> <p><b>(Any 2 for 2 marks)</b></p>	2	

Question			Expected Answer(s)	Max Mark	Additional Guidance
13	(c)	(i)	<ul style="list-style-type: none"> <li>• avoid posting inappropriate comments/language (<b>1 mark</b>) may offend other cultures (<b>1 mark</b>)</li> </ul> <p>Or</p> <ul style="list-style-type: none"> <li>• recycling print cartridges, only print when necessary (<b>1 mark</b>) reduces carbon footprint (<b>1 mark</b>)</li> </ul> <p>Other possible answers could include:</p> <ul style="list-style-type: none"> <li>• Participating in the community on a global scale, sharing of ideas and opportunities with people from other countries</li> <li>• Being aware of global issues, maybe donating to a humanitarian appeal online or adding signature to global petition to raise awareness of some issue</li> <li>• Reuse of computers/parts instead of just throwing out, upgrading or donating old equipment to others.</li> </ul>	2	Insist on idea of posting/broadcast for 1 mark
13	(c)	(ii)	<ul style="list-style-type: none"> <li>• twitter/facebook – cyber bullying, organising group violence</li> <li>• e-commerce – effect on high street shops, social aspects</li> <li>• access to offensive material</li> <li>• online gaming – social skills, addiction</li> <li>• online gambling – ease of access, addiction</li> <li>• division of society between information rich and information poor</li> <li>• increase in non face-to-face communication leading to a loss of social/interpersonal skills</li> <li>• any other acceptable answer relating to damaging of society</li> </ul> <p>(any 1 bullet for 2 marks)</p>	2	<p>Do not accept any answer which refers to affecting individuals on one to one basis</p> <p>Answers must contain a <u>global</u> aspect</p>

Question			Expected Answer(s)	Max Mark	Additional Guidance
13	(c)	(iii)	<p>Computer Misuse Act (1 mark) – unauthorised access to other users’ social networking sites (1 mark)</p> <p><b>Or</b></p> <p>RIPA (1 mark) – emails or ‘private’ messages may be viewed by authorities (1 mark)</p> <p><b>Or</b></p> <p>Copyright, Designs and Patents Act (1 mark) – using or distributing copyright media without permission (1 mark)</p>	2	Insist on profile or reference to social networking account.

**Section III**

**Part A – Applied Multimedia**

Question			Expected Answer(s)	Max Mark	Additional Guidance
14	(a)	(i)	<ul style="list-style-type: none"> <li>group of people working together (1 mark)</li> <li>on a project/outcome (1 mark)</li> </ul>	2	Working together - 1 mark Working together on a project - 2 marks
14	(a)	(ii)	<ul style="list-style-type: none"> <li>making use of video/web/teleconferencing</li> <li>application sharing/working on same file (eg whiteboard, on-line meeting tools)</li> </ul> <p>(1 mark for any multimedia application – idea of ‘live’ performance)</p> <ul style="list-style-type: none"> <li>allows group discussions to take place, improves communication</li> <li>virtual meetings can be hosted, so possible if team apart</li> <li>sharing information with team members, discuss ideas</li> <li>less chance of duplication of ideas</li> <li>more co-ordinated team as all updated documents available from any location at any time</li> </ul> <p>(1 mark for any suitable benefit)</p>	2	
14	(b)		<p><b>data transfer rate</b></p> <ul style="list-style-type: none"> <li>load faster from DVD</li> <li>dependant on bandwidth for www</li> </ul> <p><b>ease of update</b></p> <ul style="list-style-type: none"> <li>DVD – not suitable</li> <li>www – suitable</li> </ul> <p><b>capacity</b></p> <ul style="list-style-type: none"> <li>DVD limited capacity (single layer 4.7Gb).</li> <li>www only limited by server storage.</li> </ul> <p>(1 mark for each criteria – max 2 marks 1 mark for comparison – max 2 marks)</p>	4	0 marks for comparison without criteria

Question			Expected Answer(s)	Max Mark	Additional Guidance
15	(a)	(i)	<ul style="list-style-type: none"> <li>provides a contract between the two parties</li> <li>complete detail</li> <li>protects the developer by setting a budget</li> <li>protects the client by setting a timescale</li> </ul> <p>(1 mark for each point, max 2 marks)</p>	2	Or other examples of protecting the developer/client from the requirement specification list
15	(a)	(ii)	<p><b>purpose</b> – to help promote the pizza chains business</p> <p><b>user/audience</b> – customers of the pizza chain</p> <p><b>content</b> – information about special offers</p> <p><b>delivery media</b> – smartphones/mobile communication devices</p> <p>(1 mark each for item and information – max 4 marks)</p> <p>hardware/software, budget, timescale not specified (1 mark only)</p>	4	Information without item – 0 marks Insist on user/audience
15	(b)	(i)	<p>Responsible for</p> <ul style="list-style-type: none"> <li>structure</li> <li>storyboards</li> <li>navigation</li> <li>layout</li> <li>works closely with any other named member of team (not webmaster).</li> </ul> <p>(1 mark for each valid point – max 2 marks)</p>	2	Do not accept overall design
15	(b)	(ii)	<p><b>Project Manager</b> – meets restaurant chain representative and discusses the requirements of the app, assembles team members, monitors time and budget</p> <p><b>Multimedia Programmer</b> – creates overall pizza application</p> <p><b>Media Specialist</b> – produces the icon graphic for the app</p> <p>(1 mark for correct position, 1 mark for role)</p>	2	

Question		Expected Answer(s)	Max Mark	Additional Guidance
15	(c)	<p><b>screen testing</b> –matches original design, functions/buttons work e.g. video plays, audio plays, etc.</p> <p><b>integration testing</b> – screens work together, links work</p> <p><b>acceptance testing</b> – restaurant chain test app and match against contract</p> <p><b>usability testing</b> – selected user group trial the pizza app</p> <p><b>(1 mark for each testing type, 1 mark for description – max 4 marks)</b></p>	4	
16	(a)	<p><b>breadcrumbs</b> – trail ‘Brankling/Courses...’ along top left of page to get back to a main page.</p> <p><b>search facilities</b> – search box allows entering of terms, which the site is then searched to find</p> <p><b>backtracking</b> – use of left/back arrow until you are back to a familiar page</p> <p><b>(1 mark for each correct name, 1 mark for each linked description – max 4 marks)</b></p>	4	
16	(b)	<p>requires no additional/specialist software/ does not need a player <b>(2 marks)</b></p>	2	
16	(c)	<ul style="list-style-type: none"> <li>• fitness for purpose</li> <li>• clarity of presentation</li> </ul> <p><b>(1 mark each criteria – max 2 marks)</b></p>	2	

Question			Expected Answer(s)	Max Mark	Additional Guidance
16	(d)		<p>relevance (relevant/appropriate/appropriateness) – information all about the course, so relevant to the student</p> <p>accuracy (accurate) – assume accurate in module titles</p> <p>completeness (complete) – all 5 topics listed, so complete course outline</p> <p>reliability (reliable/objective/objectivity) – university website is a reliable source</p> <p>timing – material ready for start of first year</p> <p>level of detail (concise/conciseness) – minimal, straight to the point with no unnecessary information</p> <p>presentation – clearly set out, consistent in style</p> <p>availability – information available continually, good timing for first years</p> <p><b>(1 mark each for two characteristics, 1 mark for each justified comment – max 4 marks)</b></p>	4	<p>No mark for comment <u>without</u> characteristic</p> <p>These are sample answers, other valid opinions acceptable.</p>
17	(a)		<p>Photo in top half of page and logo in left corner <b>(1 mark)</b></p> <p>Photo and logo labelled <b>(1 mark)</b></p> <p>4 links shown <b>(1 mark)</b></p>	3	
17	(b)	(i)	<p>(A) jpeg <b>(1 mark)</b></p> <ul style="list-style-type: none"> <li>• jpeg has 24 bit colour</li> <li>• smooth variations of colour</li> <li>• no bands of colour</li> </ul> <p><b>( any bullet 1 mark)</b></p>	2	
			<p>(B) gif <b>(1 mark)</b></p> <ul style="list-style-type: none"> <li>• gif lossless compression so better for images with sharp contrast</li> <li>• 256 colours ideal for simple shapes / line art (don't need any more)</li> <li>• transparency possible <b>(1 mark)</b></li> </ul>	2	Compression + reason for 1 mark

Question			Expected Answer(s)	Max Mark	Additional Guidance
17	(b)	(ii)	<ul style="list-style-type: none"> <li>• text details – font, style or sizes</li> <li>• background colour information</li> <li>• button interactivity – button visual details, where it links to</li> <li>• image details – name/path/size</li> </ul> <p><b>(1 mark for each additional piece of information – max 3 marks)</b></p>	3	
17	(c)	(i)	<p>7 or 8 boxes (1 mark) Then Double arrows on 1, 3 &amp; contact (if present) (1 mark) Linear loop (1 mark) Labelling (1 mark)</p>	4	<p>If candidate has not drawn 7 or 8 nodes then 0 marks (Note: if the Contacts page button was missed out in part (a) – don't double penalise e.g. only 6 nodes possible)</p> <p>(note: double arrows within the linear section Box 2 onwards – not to be penalised)</p>
17	(c)	(ii)	<p>Hybrid / Composite (1 mark) - mix of linear and hierarchical structures (1 mark)</p>	2	Refer to question as it refers to diagram drawn in part c i



**Section III**  
**Part B – Expert Systems**

Question			Expected Answer(s)	Max Mark	Additional Guidance																
18	(a)	(i)	4																		
			<table border="1"> <thead> <tr> <th>Gull</th> <th>Primary Feather</th> <th>Beak</th> <th>Legs</th> </tr> </thead> <tbody> <tr> <td>Caspian</td> <td>Large white tip</td> <td>Long slender</td> <td>Pale pink to pale yellow</td> </tr> <tr> <td>Herring</td> <td>Small white spots</td> <td>Thick yellow</td> <td>Pinkish</td> </tr> <tr> <td>Yellow-legged</td> <td>Small white spots</td> <td>Prominent red spot</td> <td>Custard yellow</td> </tr> </tbody> </table>	Gull	Primary Feather	Beak	Legs	Caspian	Large white tip	Long slender	Pale pink to pale yellow	Herring	Small white spots	Thick yellow	Pinkish	Yellow-legged	Small white spots	Prominent red spot	Custard yellow		
Gull	Primary Feather	Beak	Legs																		
Caspian	Large white tip	Long slender	Pale pink to pale yellow																		
Herring	Small white spots	Thick yellow	Pinkish																		
Yellow-legged	Small white spots	Prominent red spot	Custard yellow																		
			<ul style="list-style-type: none"> <li>• Table produced with the three types of gull on different rows (or columns) <b>(1 mark)</b></li> <li>• Table includes headings such as ‘Primary Feather’/‘Beak’/‘Legs’ or a selection of similar – not all required <b>(1 mark)</b></li> <li>• Three columns of factors correct <b>(2 marks)</b> or</li> <li>• One column of factors correct <b>(1 mark)</b></li> </ul>																		
18	(a)	(ii)	<p>gull IS ‘Caspian’  IF primary_feather IS ‘large white tip’  AND beak IS ‘long slender’  AND legs IS ‘pale pink to pale yellow’</p> <p>gull IS ‘Herring’  IF primary_feather IS ‘small white spots’  AND beak IS ‘thick yellow’  AND legs IS ‘pinkish’</p>	5																	

Question			Expected Answer(s)	Max Mark	Additional Guidance
18	(a)	(ii)	<p>gull IS 'Yellow-legged'  IF primary_feather IS 'small white spots'  AND beak IS 'prominent red spot'  AND legs IS 'custard yellow'</p> <ul style="list-style-type: none"> <li>• Use of IF and AND (1 mark)</li> <li>• Use of IS (or =) and appropriate variable (1 mark)</li> <li>• Any correct rule with at least two conditions (1 mark)</li> <li>• Three correct rules with three conditions (1 mark)</li> <li>• Backward chaining format (1 mark)</li> </ul>		<p><b>Notes</b>  Do not deduct marks for poor syntax with capitals or missing "  Accept variable names like 'feather' or 'leg' or 'bird'</p> <p><b>Accept 'or' with Caspian</b>  Gull IS 'Caspian'  IF primary_feather IS 'large white tip'  AND beak IS 'long slender'  AND legs IS 'pale pink'  OR legs IS 'pale yellow'</p> <p><b>Accept using two rules for Caspian</b>  Gull IS 'Caspian'  IF primary_feather IS 'large white tip'  AND beak IS 'long slender'  AND legs IS 'pale pink'</p> <p>Gull IS 'Caspian'  IF primary_feather IS 'large white tip'  AND beak IS 'long slender'  AND legs IS 'pale yellow'</p> <p><b>Accept</b>  ADVISE gull IS 'Caspian'  IF primary_feather IS 'large white tip'  AND beak IS 'long slender'  AND legs IS 'pale pink to pale yellow'</p> <p><b>Award 4 out of 5 for solutions of the form</b>  IF primary_feather IS 'large white tip'  AND beak IS 'long slender'  AND legs IS 'pale pink to pale yellow'  THEN gull is 'Caspian'</p>

Question			Expected Answer(s)	Max Mark	Additional Guidance
18	(a)	(iii)	<ul style="list-style-type: none"> <li>Begins with a hypothesis of Caspian/ assumes it is Caspian / tests for Caspian (or any other) (1 mark)</li> <li>Tests each condition (for Caspian) (1 mark)</li> <li>If condition not satisfied then next hypothesis is Herring (1 mark)</li> </ul> <p><b>A generic answer – no mention of gulls – could only get 2<sup>nd</sup> and 3<sup>rd</sup> mark</b></p>	3	
18	(a)	(iv)	<p>The inference engine can use a rule tree to generate justifications (1 mark)</p> <p>Both the solutions below illustrate the type of solution a candidate may produce. Accept any similar allowing for variations in style. A generic answer – no mention of gulls – could only get 1<sup>st</sup>, 3<sup>rd</sup> and 4<sup>th</sup> mark</p> <pre> graph TD     Advice([Advice]) --- HG1[Herring gull]     HG1 --- And([And])     And --- PFS[Primary feather has small white spots]     And --- TYB[Thick yellow beak]     And --- PL[Pinkish legs]      HG2([Herring gull]) --- PFS2[Primary feather has small white spots]     HG2 --- TYB2[Thick yellow beak]     HG2 --- PL2[Pinkish legs] </pre>	4	<p>Rule tree has specific advice – Herring gull – at the top (1 mark) connected to (1 mark) the three conditions – small white spots on primary feather; thick yellow beak; pinkish legs (1 mark)</p>

Question			Expected Answer(s)	Max Mark	Additional Guidance
18	(b)	(i)	<p>problem – misinterpretation of the expert advice (by the knowledge engineer)  solution – system validation by Nigel (the expert) should have detected this</p> <p>problem – incorrect advice from Nigel (the only expert)  solution – (an)other expert source(s) should also have been consulted</p> <p><b>1 mark for each problem and 1 mark for each solution</b></p>	4	
18	(b)	(ii)	<ul style="list-style-type: none"> <li>• The user might not be sure</li> <li>• If it is custard yellow or prominent or thick or whatever from the classifications</li> <li>• Introduce certainty factors</li> <li>• For the responses entered by the user</li> </ul> <p><b>1 mark for each bullet (4 marks)</b></p>	4	
18	(c)		<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Preservation of expertise</li> <li>• Dissemination of expert knowledge</li> <li>• Training</li> <li>• Combining expertise of multiple experts</li> </ul> <p><b>Limitations</b></p> <ul style="list-style-type: none"> <li>• Restricted domain</li> <li>• Development costs</li> <li>• Maintenance costs</li> </ul> <p><b>(1 mark for one benefit and 1 mark for one limitation)</b></p>	2	

Question		Expected Answer(s)	Max Mark	Additional Guidance
19	(a)	<p>A – lose passport            B – forget tickets            C – not allowed to board flight</p> <p><math>A \vee B \rightarrow C</math></p> <ul style="list-style-type: none"> <li>key for symbols used</li> <li>use of <math>\vee</math> for or</li> <li>correct logic with <math>\rightarrow</math></li> </ul> <p><b>1 mark for each bullet (3 marks)</b></p>	3	<p><b>Note:</b>            Any symbol can be used.            ‘C – allowed to board flight ‘<math>A \vee B \rightarrow \neg C</math>’ gets 3 marks</p>
19	(b)	<p>vegetarian (‘Morag’) (1 mark)</p> <p><math>\forall X</math>: vegetarian (X) <math>\rightarrow</math> pasta (X)</p> <ul style="list-style-type: none"> <li>Use of variable with capital letter and no other capitals (Morag OR ‘Morag’ in quotes is acceptable)</li> <li>Use of same predicate in both statement and use of <math>\forall</math> and <math>\rightarrow</math></li> <li>Correct logical statement with variable appearing three times</li> </ul> <p><b>1 mark for each bullet</b></p>	4	<p><b>Accept reasonable variations for pasta – pasta (X,flight) – and X, but capitals or double words would not be awarded the 2<sup>nd</sup> mark (4 marks)</b></p>
19	(c)	<ul style="list-style-type: none"> <li>relevance (relevant/appropriate/appropriateness) - good because it relates to her flight (or bad because I’m not interested in going abroad or vegetarians)</li> <li>accuracy (accurate) - good because it is true (or bad because you do not need tickets)</li> <li>completeness (complete) - bad because it doesn’t deal with how much luggage, which airport, what time etc</li> <li>reliability (reliable/objective/objectivity) - not sure because it doesn’t give the source</li> <li>timing - good because it is given when she is planning to fly</li> <li>level of detail (concise/conciseness) - good because it is short and to the point (or bad because it doesn’t give any detail about time, airport, luggage etc)</li> <li>presentation - good/fair/poor because it is printed in italics</li> <li>availability - good because she has got the information (or unsure because she might lose it)</li> </ul> <p><b>(1 mark each for two characteristics, 1 mark for each justified comment – max 4 marks)</b></p>	4	<p>These are sample answers, other valid opinions acceptable.</p>

Question		Expected Answer(s)	Max Mark	Additional Guidance
20	(a)	<ul style="list-style-type: none"> <li>• domain is medical or internal diseases</li> <li>• category is diagnosis</li> <li>• combines forward chaining with backward chaining</li> <li>• symptoms used to form hypothesis</li> <li>• contains massive (100 000) number of relationships between symptoms and diseases</li> <li>• based on the work of Jack D. Myers MD</li> <li>• at the University of Pittsburgh</li> <li>• built up through the 70's</li> <li>• not Bayesian (or pattern recognition)</li> <li>• powerful ranking algorithm (or heuristic rules)</li> <li>• poor when patient has more than one disease</li> </ul> <p><b>1 mark for each bullet point (maximum 3 marks)</b></p>	3	<b>Other answers possible (but need <u>checking</u>)</b>
20	(b)	<ul style="list-style-type: none"> <li>• purpose</li> <li>• type of expert system</li> <li>• domain of expertise</li> <li>• range and coverage of rules</li> <li>• (quality of) user interface</li> <li>• the way (structure/syntax/order) questions are asked</li> <li>• presentation of the conclusion</li> <li>• quality of explanation facilities</li> <li>• correctness of conclusions</li> <li>• fitness for purpose</li> </ul> <p><b>1 mark for each bullet (maximum 4 marks)</b></p>	4	<b>Exact terms are not required but the candidate must use appropriate language to gain any credit – do not try and match up ‘woolly’ descriptions to one of the bullets</b>
21	(a)	<ul style="list-style-type: none"> <li>• Rules (1 mark)</li> <li>• which can be fired (1 mark)</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• with conditions which match working memory (1 mark)</li> </ul>	2	Facts that match the rules which can be fired - 0 marks

Question		Expected Answer(s)	Max Mark	Additional Guidance
21	(b)	<ul style="list-style-type: none"> <li>• working memory has</li> <li>• only a few facts changed</li> <li>• many rules share the same conditions</li> <li>• when a fact is added or deleted only they are affected</li> <li>• maintains a list of matches between facts and conditions</li> </ul> <p><b>1 mark for any bullet (maximum 2 marks)</b></p>	2	
21	(c)	<ul style="list-style-type: none"> <li>• different sets of rules</li> <li>• a rule agenda (set of rules) is selected</li> </ul> <p><b>1 mark for each bullet (2 marks)</b></p>	2	

**Section III**  
**Part C – The Internet**

Question		Expected Answer(s)	Max Mark	Additional Guidance
22	(a)	A – CustomCut Catalogue B – 0 C – Alt D – src E -- /tbody (or td or tr or /table)  <b>1 mark each</b>	5	Accept "0"
22	(b)	Sets the width of the table to the entire width of the window/screen/browser/page	1	
22	(c)	<pre>&lt;a href="WU155.html"&gt;-more details&lt;/a&gt;</pre> <pre>&lt;a href = (2 marks) &lt;a href (1 mark)</pre> <pre>"WU155.html" (1 mark)</pre> <pre>&gt;- more details (1 mark)</pre> <pre>&lt;/a&gt; (1 mark)</pre>	5	
22	(d) (i)	13	1	
22	(d) (ii)	17	1	
22	(d) (iii)	18	1	
22	(e)	<b>Benefit</b> <ul style="list-style-type: none"> <li>• can easily see what the style is</li> <li>• can specify small part of text it applies to</li> <li>• can overwrite the stylesheet on a small part of the text/code/page</li> </ul> <b>1 mark per bullet</b>	4	
		<b>Drawback</b> <ul style="list-style-type: none"> <li>• has to be repeated for every line it is to be applied to</li> <li>• can lead to bloated code</li> <li>• time consuming to edit</li> </ul> <b>1 mark per bullet</b> <b>Maximum 4 marks</b>		



Question			Expected Answer(s)	Max Mark	Additional Guidance
23	(a)		An IP address consists of a network part (1 mark) and a rest/host part (1 mark) <b>OR</b> 32 bits (1 mark) arranged as 4 octets (1 mark) Or Four (1 mark) 8 bit octets (1 mark)	2	
23	(b)		1. Class B 2. Class C 3. Class C 4. Class C 5. Class A  <b>1 mark each</b>	5	
23	(c)	(i)	2	1	
23	(c)	(ii)	<ul style="list-style-type: none"> <li>• may improve network efficiency</li> <li>• may make some devices only available to others on the same subnet</li> <li>• different administrators can manage each subnet</li> </ul> <b>Any 2 bullets at 1 mark each</b>	2	
24	(a)		Commercial (1 mark) – online banking/online shopping/any other valid example of commercial site (1 mark)	2	
24	(b)		Academic (1 mark) – any of the following applied to university/college/school <ul style="list-style-type: none"> <li>• Lecture/revision notes</li> <li>• Departmental website</li> <li>• Any other academic use</li> <li>• Edutainment/online training/online assessment</li> </ul>	2	Any other valid example of academic site
25	(a)		Protocol (1 mark) Path (name) (1 mark) port (1 mark)	3	

Question		Expected Answer(s)	Max Mark	Additional Guidance
25	(b)	<ul style="list-style-type: none"> <li>• relevance (relevant/appropriate/ appropriateness) – all the information is relevant to downloading the Clickweb software</li> <li>• accuracy (accurate) – description accurately describes the software or not accurate as you might not get an instant download</li> <li>• completeness (complete) – all information is there – no omissions or not complete as it only deals with download information and does not tell you anything else about the package</li> <li>• reliability (reliable/objective/objectivity) – contains no opinions therefore not bias</li> <li>• timing - good as you can download immediately after payment</li> <li>• level of detail (concise/conciseness) – minimal, to the point with no unnecessary information</li> <li>• presentation - minimalistic, uncluttered, good graphics</li> <li>• availability – good because it is available to download from the web after payment</li> </ul> <p><b>(1 mark each for two characteristics, 1 mark for each justified comment – max 4 marks)</b></p>	4	These are sample answers, other valid opinions acceptable.
25	(c)	<p>This page has no complex elements, graphics and text straightforward so there should be no browser compatibility issues. <b>(2 marks)</b></p> <p><b>OR</b> This page leads to a download so the browser will have to be one which offers this facility <b>(2 marks)</b></p> <p><b>OR</b> If this page was created with Clickweb or other web authoring package it may have special HTML tags that might not be recognised by older browsers <b>(2 marks)</b></p>	2	

Question			Expected Answer(s)	Max Mark	Additional Guidance
25	(d)	(i)	Page layout design should be simpler (1 mark) in authoring package as it is WYSIWYG (1 mark) OR Writing HTML directly may give more “fine control” over layout (1 mark) so more precise layout (1 mark)	2	Dragging elements onto page implies simpler therefore accept for 1 mark
25	(d)	(ii)	Download efficiency may be decreased with web authoring (1 mark) as code may be somewhat more bloated (1 mark)	2	Only accept large file size if there is a reason eg extra code created.
25	(e)		Does not have to leave the authoring package or use a different package/client to upload the pages/site (1 mark)	1	
25	(f)		<p><b>Firewall</b></p> <ul style="list-style-type: none"> <li>• Checks data packets</li> <li>• Between network and Internet</li> <li>• Blocks/filters/quarantines bad packets</li> <li>• Restrict access</li> <li>• Only accepts traffic on a particular port</li> </ul> <p><b>(any 2 bullets for 2 marks)</b></p> <p><b>Secure sockets</b></p> <ul style="list-style-type: none"> <li>• Uses keys</li> <li>• Encryption</li> <li>• Uses certificates</li> <li>• Creates private channel</li> </ul> <p><b>(any 2 bullets for 2 marks)</b></p>	4	

[END OF MARKING INSTRUCTIONS]