National
Qualifications

CS(N5)14A

Computing Science

Marking Instructions

perfectpapers

Number			Question	Instructions	Marks
1.			Convert the value 37 into an 8-bit *binary* number. Show your working.	32 | 16 | 8 | 4 | 2 | 1 1 | 0 | 0 | 1 | 0 | 1 **(1 mark)**	1
2.			Name the *bus* used to select memory locations to be read from or written to by the processor.	Address bus **(1 mark)**	1
3.			The *pseudocode* below shows how a program could store and process the top scores of the players in an online computer game. [See paper] State the most suitable *data structure* and data type for storing the highlighted variable (**topscores**) used above.	Array **(1 mark)** of Integers **(1 mark)**	2
4.			A *web page* can be found using the URL: http://www.ednet.com/groups/national-5-computing-science/home.php State the *protocol* being used by this URL.	Hypertext transfer protocol (do not accept a repetition of http). **1 mark**	1
5.			The following section of code is written in the programming language Ada. [see paper] State **two** techniques that the programmer could use to make this code more readable.	Any two of the following: • Indentation of code • Adding commentary • Syntax highlighting • Use of meaningful identifiers **1 mark each, max 2 marks**	2

Number			Question	Instructions	Marks
6.			Explain why the data values TRUE and FALSE should be stored in a field of type *Boolean* rather than a field of type *text*.	Using a text data type will use more storage than a Boolean type because a Boolean field could use as little as one bit but a TEXT field will use at least 5 bytes. **(1 mark)** *Answer should focus on the number of bits required to hold the data.*	1
7.			Companies must adhere to health and safety legislation for employees using computer systems regularly. Adjustable blinds or curtains can reduce the amount of screen glare and reflections for users to prevent eyestrain. Name **one** other workstation feature and describe how it reduces a risk to health.	Adjustable workstation chairs: Users can adjust the chair to their own height/posture to prevent back ache or issues with poor posture. **(1 mark)** Adjustable height workstation: Height/position of workstation can be varied to optimum position for worker to prevent back/muscle injury **(1 mark)** Ergonomic keyboard/mouse: Enables user to keep hands/wrist in a comfortable position to avoid RSI **(1 mark)**. *Need both feature and description for 1 mark.*	1
8.			State where instructions and data are held within the processor after being transferred from memory.	In registers **(1 mark)**	1
9.			Describe the role of the *client* in a *client/server* network.	• Client makes requests of the server • Client is provided with access depending on access rights/privileges. • Other valid **1 mark for one bullet** *Candidate must show an understanding of the role of the client with relation to a client/server network and in relation to ` server component.*	1

Number			Question	Instructions	Marks
10.			Abergow Hospital has recently upgraded all the computer systems used by staff. They have arranged for the environmentally friendly disposal of the old equipment. Describe **one** other issue that should be considered when disposing of the old equipment.	Issues should relate to the protection of personal data or access to systems (Data Protection Act). • Removal of data from equipment/erasure of storage media • Destruction of media/drives to prevent future access. • Other valid **1 mark for one bullet**	1
11.			Describe **one** typical feature of an operating system developed to support smartphones of the type shown.	Focused on touch input/virtual keyboard Often operating system is closely integrated with hardware (i.e. suitable for low-power processors and other hardware) Designed to reduce processor load and extend battery life / or control battery usage. **1 mark for one bullet**	1
12.			Face recognition is one example of *biometrics* that can be used to secure access to mobile devices. Describe **one** benefit of face recognition for this purpose.	No two people have the same face to it is relatively secure. You always have your face with you to unlock the phone. **1 mark for one bullet**	1
13.			A web site has been hacked and the usernames, email addresses and passwords of users have been stolen.		
	(a)		Describe how *keylogging* software may have been used in this hacking attack.	Keylogging software can record the key presses a user makes, recording usernames and passwords. These details can then be used to gain access to systems. **1 mark**	1

Number			Question	Instructions	Marks
	(b)		Explain what users should do to protect their security after this hacking attack.	• Security scan their computer systems for keylogging software. • Change all passwords. **1 mark for one bullet**	1
14.			Explain why *JavaScript* is required to validate data in a HTML form **before** it is submitted.	• HTML cannot carry out operations on form fields (it only details the structure of document). • JavaScript can view the form contents and carry out the validation in the browser client using the DOM model. *Answer must cover HTMLs lack of processing capabilities and JavaScript's ability to access HTML elements in the browser.* **1 mark for each bullet, max 2 marks**	2
15.			Here is part of a database used to store information about meteor showers. [see paper] Describe how the data has been sorted.	Data has been sorted on: Observations, ascending **(1 mark)** Rate, descending **(1 mark)** *Both the sort field and the direction of the sort are required for each mark. No marks awarded for fields with sort direction.*	2

Number			Question	Instructions	Marks
16.			Social media allows users to share web links with others. [see paper] To calculate the popularity of a web link the number of times it has been shared on different social media platforms are added together. In the table shown, the popularity is 1067 (236 + 231 + 190 + 410) A program is designed to calculate the popularity of a web link from a list of shares on social media sites. [see paper]		
	(a)	(i)	The above design was created using *pseudocode*. Name another *design notation* that could have been used instead.	Any of the following: • Structure diagram • Flow chart/diagram • UML diagrams (there are many examples: class, component, deployment, object etc.) • Wireframing • Data Flow Diagram **1 mark each bullet**	1
		(ii)	Describe **one** advantage of using this *design notation* rather than *pseudocode*.	Points will depend on notation used but may include: • Presents high level view of processes • Shows flow of data between storage, processes and other elements • Presents visual representation of the order of program events/processes **1 mark for one advantage**	1

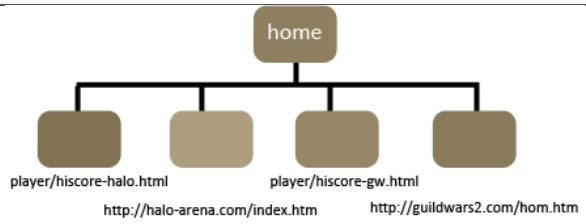
Number			Question	Instructions	Marks
	(b)		Identify the *variables* and state their *data types* used in the program design.	• popularity: integer • weblink: string • shares: integer *Needs both the variable name and the data type for each mark.* **1 mark for each bullet, max 3 marks**	3
	(c)		A pre-defined function is used on Line 3 of the design. State the name of another predefined function which you are familiar with and describe its purpose.	Candidate may give name of a predefined function from a wide range of languages. Some examples are: Java • toString(): returns the string representation of a number's value. • concat(): combines the text of two strings and returns a new string. Visual Basic .net • Asc(): Returns the 8-bit ASCII code corresponding to a character • Fix(): Returns the integer part of a floating point number, Python • cmp(): compare two objects and return an integer according to the outcome. • min(): returns the smallest item from the arguments presented. **Requires the name of the function for 1 mark and a description of it's purpose for 1 mark.**	2

Number			Question	Instructions	Marks

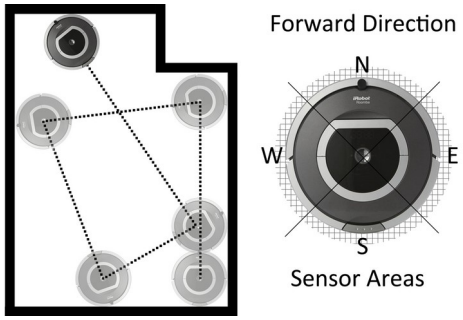
	(d)		[see paper]
			
			The program above stops when the user enters -1.
			
			There is an error in this program which means that -1 is always added to the "popularity" before the program finishes.
			
			Use pseudocode or a programming language of your choice to show how you would correct the program so that this error is removed.
				After line 3 insert/amend code as follows:
				
				IF popularity >= 0 THEN
				SET popularity to popularity + shares
				END IF
				
				1 mark for use of IF or similar
				
				1 mark for correct condition
				
				1 mark for use of END IF or indentation to show structure where END IF not available.
					3

17.			A programming language provides the following built-in functions. [see paper] These can be used by the programmer to manipulate strings of text. An example program, with notes on the execution, are shown below. The first character in a string is always position 1. [see paper]		
	(a)		State the output that would be created by the following program.	The following three passes are applied to the string "computing" • Pass 1: swap(3,5,"computing") • Result: "coupmting" **(1 mark)** • Pass 2: swap(2,4,"coupmting") • Result: "cpuomting" **(1 mark)** • Pass 1: swap(1,3,"cpuomting") • Result: "upcomting" • Output is "upcomting" **(1 mark)** **Correct output with no working award 3 marks**	3

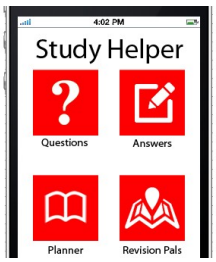
Number			Question	Instructions	Marks
	(b)		State the type of loop shown in the program. Justify your answer.	The loop is a conditional loop **(1 mark)** Because it will continue while the condition (counter > 0) is TRUE **(1 mark)** *Answer must reference the actual condition in the explanation for the mark.*	2
	(c)		The program is used to generate 800 strings each with a length of 128 characters. These are stored in a text file using an 8-bit character set. Calculate the *storage requirements* of this saved text file. Give your answer in appropriate units. Show your working	128 characters * 800 strings * 8 bits per character 128 * 800 * 8 = 819200 bits **(1 mark)** $\frac{819200}{8} = 102400\ bytes$**(1 mark)** $\frac{102400}{1024} = 100\ kilobytes$ **(1 mark)** *3 marks for 100 kb without working*	3
	(d)		A change is made to the program but when it is translated the following error message is displayed. Error: Unexpected use of ";" at line 12 Name the type of error that has occurred. Justify your answer.	Syntax error **(1 mark)** • Because the error highlights the incorrect use of a text character in the code which points to the syntax (the rules about how the code is constructed). **(1 mark)** **OR** • Because the error highlights the incorrect use of a text character in the code which is neither a logic or a runtime error **(1 mark)**.	2
18.			The following HTML is used to create a web page. [see paper]		

Number			Question	Instructions	Marks
	(a)		From the HTML above, identify an *internal hyperlink* and an *external hyperlink*.	Internal: • player/hiscore-halo.html • player/hiscore-gw.html External: • http://halo-arena.com/index.htm • http://guildwars2.com/home.htm **1 mark for one internal, 1 mark for one external**	2
	(b)		This web page is stored in the root directory of the server "http://www.gamezone.com". Use this information to change one of the *relative* addresses used in the web page to an *absolute address*.	The relative addresses are • player/hiscore-halo.html • player/hiscore-gw.html So the absolute addresses would be: • http://www.gamezone.com player/hiscore-halo.html • http://www.gamezone.com player/hiscore-gw.html **1 mark for one of the above absolute addresses.**	1
	(c)		Draw a diagram to illustrate the navigation structure used in the web page above.	 *diagram should show the hierarchy of the original page leading to the four given links.* **1 mark**	1
	(d)		Describe a test that should have taken place when this web page was being developed.	Check navigation: checking each of the web links points to the required destination **(1 mark)**. Check screen matches design – ensuing correct elements on the page, layout is correct and spelling/presentation is accurate **(1 mark)**.	1

Number			Question	Instructions	Marks
	(e)		The follow web page code has been created to ensure *accessibility*. [see paper]		
		(i)	Give **two** examples, from the code above, which increase the accessibility of the web page.	• Skip navigation • alt="GameZone Logo" • You are at: (and navigational links) **1 mark each bullet, max 2 marks**	2
		(ii)	For **each** example given in (i) above, explain why it makes the page more accessible.	• Use of Skip Navigation to support screen readers jumping to main content. • Use of alt tag to provide screen read text relating to image • Use of breadcrumb (you are at) to aid navigation accessibility **Any two for 2 marks**	2
	(f)		The web site provides an option for users to save pages as PDF files. Describe why PDF files may be used for this purpose.	PDF pages can be viewed offline and will retain the look of the website for this purpose. **(1 mark)**	1
19.			Robotic vacuum cleaners are increasingly found in modern homes. These robots move around the room and use sensors to detect when they make contact with obstacles.		

Number			Question	Instructions	Marks
	(a)		A typical robot requires sensors to measure the dimensions of the room as the robot moves. It will also use other sensors to detect when it makes contact with an obstacle. State the hardware that allows external hardware, such as the sensors, to be connected to the computer system in the robot.	Interface **(1 mark)**	1
	(b)		A robot uses an algorithm to decide how it should act when moving around a room. The robot can only move forward in the direction shown. The robot has four "Sensor Areas" and when any of these hit an obstacle the robot will respond. If it detects contact in areas "N" or "E" it turns left. If there is contact in area "W" it turns right. If the rear of the robot is bumped it stops, waits 10 seconds and then moves forward again.  The *pseudocode* below shows a design for part of the program used by the robot. There are **two** errors in the logic of the program design. Find and describe each error made. [see paper]	Line 4: Can't be touching both sensor N and sensor E. **(1 mark)** Line 6. Will never do the first part of IF statement because condition will never be met as touch would always equal N OR E. **(1 mark)** *(accept N AND E)*.	2

Number			Question	Instructions	Marks
	(c)		To operate the robot two settings are entered. The length of operation, in minutes from (1 to 60) and the power setting (where 1 is economy mode, 2 regular mode and 3 is super clean).		
		(i)	Complete the table below to show the four examples of *test data* and the type of each example.	• extreme • exceptional • Test data (operation – 75 minutes, power -7) *or similar out of range examples* **1 mark each bullet, max 3 marks**	3
		(ii)	Explain the purpose of fully testing a program using a variety of test data.	To ensure the program can cope with a full range of possible inputs without crashing. **(1 mark)**	1
	(d)		There are two versions of the robot cleaner. The user interfaces for version 1.0 and version 2.0 are shown below. Version 1.0 has buttons that are pressed to change the values and control the robot. Version 2.0 has a touch screen.		
		(i)	Describe two advantages of the user interface for version 2.0 when compared to version 1.0.	• Ease of operation: sliders require one touch and movement in V2.0 but in V1.0 multiple presses (or longer presses) are required. • Fewer hardware parts required: V2.0 only requires the touch screen but V.1 has 3 displays and six physical buttons each is an additional point of failure. • Higher resolution graphics on V2.0 allows uses to understand usage without language skills. **1 mark for each bullet, max 2 marks**	2
		(ii)	The programs used by robots are stored as *binary* instructions. State the name given to binary instructions.	Machine code **(1 mark)**	1

Number			Question	Instructions	Marks
20.			An app is being developed for students to use to revise for their examinations. The app will show example questions, worked answers, a study planner and the location of friends with the app who are studying the same subjects.  		
	(a)		The icons used in the app are stored using a *standard file format*.		
		(i)	State a standard file format suitable for storing these images.	JPEG, PNG, BMP, GIF **Any one for 1 mark**	1
		(ii)	Explain why the file size of an icon will be smaller if the colour depth is reduced.	The colour depth requires a certain number of bits to store the colour value of each pixel in the image **(1 mark)**. Reducing the colour depth normally reduces the number of bits required to store each pixel and therefore reduces the number of bits in the whole file **(1 mark)**	2
	(b)		The app is connected to an online database which allows users to share their locations with others.		

Number			Question	Instructions	Marks
		(i)	It is a principle of the Data Protection Act that data is held securely. State one other principle of the Data Protection Act that the app company must comply with.	All of the remaining principles apply: • Personal data shall be processed fairly and lawfully • Personal data shall be obtained only for one or more specified and lawful purposes. • Personal data shall be adequate, relevant and not excessive in relation to the purpose or purposes for which they are processed. • Personal data shall be accurate and, where necessary, kept up to date. • Personal data processed for any purpose or purposes shall not be kept for longer than is necessary for that purpose or those purposes. • Personal data shall be processed in accordance with the rights of data subjects under this Act. • Personal data shall not be transferred to a country or territory outside the European Economic Area unless that country or territory ensures an adequate level of protection for the rights and freedoms of data subjects in relation to the processing of personal data. **1 mark for any one remaining principle of the Data Protection Act.**	1
		(ii)	Some users complain that using tracking and using their location is an invasion of privacy. State what the app must do before it collects this information.	It must notify the users of the intent to process data in this way **(1 mark)**	1

Number			Question	Instructions	Marks
	(c)		Here is an example of data from the online database that stores data about users and their locations. [see paper]		
		(i)	This data is shown in a *flat-file database*. Describe **two** advantages of storing the same data in *linked tables*.	• Will be able to remove the repeating values for users (reducing the storage requirements and speed of access). • Will be able to store users without them having any location data available. • Will allow the processing of users and locations separately i.e. search and other operations. **1 mark for each bullet, max 2 marks**	2
		(ii)	Two linked tables are created – USER and LOCATION. Identify a suitable primary key for each table.	USER – Primary Key: UserID LOCATION – Primary Key: LogID **1 mark each**	2
		(iii)	Explain the purpose of a *foreign key*.	The foreign key is used to link rows with the primary key in another table **(1 mark)**	1
21.			AnyLock is a lock that can be used in most doors. The lock is controlled by mobile app. The app is used to set a 4-digit code. When the code is entered and phone is held against the lock, the door will open. [see paper]		

Number			Question	Instructions	Marks

	(a)	(i)	The details of the door and the pass code initially set up using the mobile app.
			
			Using pseudocode or a language of your choice, show how a program could check that both pass codes are the same. When the two pass codes are the same a message is display saying "Pass Codes Set". If the pass codes do not match an error is displayed saying, "Pass Codes don't match".
				IF passcode1 <> passcode2 THEN
				
				SEND "Pass Codes don't match" TO display
				
				ELSE
				
				SEND "Pass Codes Set" TO display
				
				ENDIF
				
				1 mark for use of IF
				
				1 mark for condition correctly defined
				
				1 mark for BOTH message operations
					3

		(ii)	Describe clearly, with reference to values and variables, what the following *pseudocode* does. [see paper]	1. set the value of roomlabel to the value in the textfield doorname_field 2. IF the roomlabel has a length of 0 (i.e. it is empty) THEN 3. Show an error message on the display saying it is invalid 4. IF the text is more than 24 characters then set the roomlabel to the first 24 characters of roomlabel. **1 mark for describing the variable assignment** **1 mark for the use of the len function, the condition of zero length and the subsequent error message** **1 mark for describing the use of len to detect a long string and the subsequent substringing and error message display.**	3
	(b)		Once a door and passcode are set on one mobile device the details can be automatically synced to other mobile devices. Describe how this could be achieved.	Use of cloud storage so that device settings are shared **(1 mark)** with appropriate security username/password **(1 mark)** Link to shared settings **(1 mark)** sent via email to other user **(1 mark)**	2

Number			Question	Instructions	Marks
	(c)		The app is compiled before it is made available for users of AnyLock. State **two** reasons why a compiler is used to translate the completed program.	The compiler generates an executable program file (accept machine code file) **(1 mark)** This code does not need the compiler or source code to be present in order to run the program **(1 mark)**	2
22.			A computer program is used to record the number of visits a web page receives every hour in a day. The 24 totals are stored in an array of integers called "pagehits".		
	(a)		Using pseudocode or a programming language of your choice, write a short program, in the space below, to calculate the total number of web page visits over the whole day.	SET total TO 0 FOR EACH hit FROM webhits SET total TO total + hit END FOR EACH **1 mark for initialising total** **1 mark for looping through array values** **1 mark for adding to total**	3
	(b)		The web server that stores the web page has special software on it that prevents some types of *Denial of Service (DOS) attacks*. The server keeps a list of banned computers. When any of these computers try to access the server the connection is refused. The pseudocode below shows how the system checks the id of a computer against the list of banned ids. [see paper] Describe all the events that will occur if a request is received from a banned computer.	• Initialisation of banned_list array, id_to_check and on_banned_list. • Implementation of fixed loop for each member of the array, reading value as bad_id. • IF statement with condition being met when the id_to_check is equal to a bad_id from the banned_list which will result in on_banned_list being set to TRUE **1 mark for each bullet, requires a clear description of each point for each mark. Maximum 3 marks.**	3

Number			Question	Instructions	Marks
	(c)		Describe why preventing access from certain computers can help prevent a *Denial of Service (DOS) attack*.	Hackers will use specific computers from which to launch their attacks **(1 mark)**. If these computers are known then blocking access from them may prevent them attacking the system **(1 mark)**	2
	(d)		Describe one other type of attack that can affect the security of a computer.	Virus attack: **(1 mark)** Malicious code is attached to a file, often sent via email, and opening the file causes the system to be infected with the virus code. **(1 mark)** **OR** Phishing attack: **(1 mark)** Email messages or Web content directs user to a site which may fraudulently request security details or run browser code which can attack the system **(1 mark)**.	2

Detail of Sources / Mark Allocations and Balance

Qu.	Unit	Area	Content	Marks
1	SDD	Low-level operations and computer architecture	Use of binary to represent and store integers and real numbers	1
2	SDD	Low-level operations and computer architecture	Basic computer architecture: processor, memory, buses, interfaces	1
3	SDD	Data types and structures	1-D array, integer	2
4	ISDD	Structures and links	URL	1
5	SDD	Testing and documenting solutions	readability of code (internal commentary, meaningful identifies, indentation).	2
6	ISDD	Structures and links	field types (text, numbers, date, time, graphics, calculated, link, Boolean)	1
7	ISDD	Legal implications	Health and Safety regulations	1
8	SDD	Low-level operations and computer architecture	Basic computer architecture: processor, memory, buses, interfaces	1
9	ISDD	Technical implementation (networking/connectivity)	peer-to-peer verus client/server	1
10	ISDD	Environmental impact	Disposal of IT equipment	1
11	ISDD	Technical implementation (hardware and software requirements)	Software considerations: operating systems	1
12	ISDD	Security precautions	Biometrics	1
13(a)	ISDD	Security risks	Keylogging	1
13(b)	ISDD	Security precautions	Passwords	1
14	ISDD	Coding	Scripting languages (including JavaScript)	2
15	ISDD	Purpose, features, functionality, users	Description of purpose	2
16(a)(i)	SDD	Design notations (for both software development and information system development)	other contemporary design notations	1
16a)(ii)	SDD	Design notations (for both software development and information system development)	other contemporary design notations	1
16(b)	SDD	Data types and structures	string, numeric (integer and real) variables	3
16(c)	SDD	Computational Constructs	Predefined functions	2
16(d)	SDD	Design notations (for both software development and information system development)	pseudocode to exempify programming constructs	3
17(a)	SDD	Computational constructs	Exemplification and implementation of the following constructs: iteration using fixed and conditional loops	3
17(b)	SDD	Computational constructs	Exemplification and implementation of the following constructs: iteration using fixed and conditional loops	2
17(c)	SDD	Low-level operations and computer architecture	Use of binary to represent and store graphics (bit-mapped and vector)	3
17(d)	SDD	Testing and documenting solutions	syntax, execution and logic errors in programs	2
18(a)	ISDD	Structures and links (web based)	hyperlinks (internal, external)	2
18(b)	ISDD	Structures and links (web based)	relative and absolute addressing	1

Qu.	Unit	Area	Content	Marks
18(c)	ISDD	Structures and links (web based)	navigation	1
18(d)	ISDD	Testing	Links and navigation	1
18(e)(i)	ISDD	User interface	User requirements (visual layout, navigation, selection, consistency, interactivity, readability).	2
18(e)(ii)	ISDD	User interface	User requirements (visual layout, navigation, selection, consistency, interactivity, readability).	2
18(f)	ISDD	Media Types	Standard files formats: pdf	1
19(a)	SDD	Low-level operations and computer architecture	Basic computer architecture: processor, memory, buses, interfaces	1
19(b)	SDD	Testing and documenting solutions	syntax, execution and logic errors	2
19(c)(i)	SDD	Testing and documenting solutions	normal, extreme and exceptional test data	3
19(c)(ii)	SDD	Testing and documenting solutions	normal, extreme and exceptional test data	1
19(d)(i)	ISDD	User interface	User requirements (visual layout, navigation, selection, consistency, interactivity, readability).	2
19(d)(ii)	SDD	Low-level operations and computer architecture	Use of binary to represent and store: instructions (machine code)	1
20(a)(i)	ISDD	Media Types	Standard file formats: graphics: jpeg, png	1
20(a)(ii)	ISDD	Media Types	Factors affecting file size and quality, including resolution, colour depth, sampling rate	2
20(b)(i)	ISDD	Legal implications	Data Protection Act	1
20(b)(ii)	ISDD	Legal implications	Data Protection Act	1
20(c)(i)	ISDD	Structures and links	database stucture: flat file, linked tables	2
20(c)(ii)	ISDD	Structures and links	key field	2
20(c)(iii)	ISDD	Structures and links	key field	1
21(a)(ii)	SDD	Computational constructs	Exemplification and implementation of the following constructs: iteration using: expressions to assign values to variables, iteration using fixed and conditional loops, use of selection constructs including simple and complex consitional statements and logical operators (AND, OR and NOT)	3
21(a)(ii)	SDD	Computational constructs	Exemplification and implementation of the following constructs: iteration using: expressions to assign values to variables, iteration using fixed and conditional loops, use of selection constructs including simple and complex consitional statements and logical operators (AND, OR and NOT)	3
21(b)	ISDD	Technical implementation (networking/connectivity)	comparison of local versus web/cloud.	2
21(c)	SDD	Low-level operations and computer architecture	Translation of high-level program code to binary (machine code): interpreters and compilers.	2

Qu.	Unit	Area	Content	Marks
22(a)	SDD	Computational constructs	Exemplification and implementation of the following constructs: iteration using: expressions to assign values to variables, iteration using fixed and conditional loops, expressions to return values using arithmetic operations (+, -, *, /, ^)	3
22(b)	SDD	Computational constructs	Exemplification and implementation of the following constructs: iteration using: expressions to assign values to variables, iteration using fixed and conditional loops, use of selection constructs including simple and complex consitional statements and logical operators (AND, OR and NOT)	3
22(c)	ISDD	Security risks	Denial of Service (DOS) attack	2
22(d)	ISDD	Security risks	Spyware, phishing, keylogging	2
			Total	90

Balance of Marks

ISDD/SDD

Area	ISDD	SDD	Grand Total
Coding	2		2
Computational Constructs		19	19
Data types and structures		5	5
Design notations (for both software development and information system development)	5	(5)	5
Environmental impact	1		1
Legal implications	3		3
Low-level operations and computer architecture		10	10
Media Types	4		4
Purpose, features, functionality, users	2		2
Security precautions	2		2
Security risks	5		5
Structures and links	7		7
Structures and links (web based)	4		4
Technical implementation (hardware and software requirements)	1		1
Technical implementation (networking/connectivity)	3		3
Testing	1		1
Testing and documenting solutions		10	10
User interface	6		6
Grand Total	**46**	**44**	**90**

Knowledge and Understand / Problem Solving

Qu	Unit	KU	PS	Marks
1	SDD		1	1
2	SDD	1		1
3	SDD		2	2
4	ISDD	1		1
5	SDD		2	2
6	ISDD	1		1
7	ISDD	1		1
8	SDD	1		1
9	ISDD	1		1
10	ISDD	1		1
11	ISDD	1		1
12	ISDD	1		1
13(a)	ISDD		1	1
13(b)	ISDD		1	1
14	ISDD	2		2
15	ISDD		2	2
16(a)(i)	SDD	1		1
16a)(ii)	SDD		1	1
16(b)	SDD		3	3
16(c)	SDD	2		2
16(d)	SDD		3	3
17(a)	SDD		3	3
17(b)	SDD		2	2
17(c)	SDD		3	3
17(d)	SDD		2	2
18(a)	ISDD		2	2
18(b)	ISDD		1	1
18(c)	ISDD		1	1
18(d)	ISDD	1		1
18(e)(i)	ISDD		2	2
18(e)(ii)	ISDD		2	2
18(f)	ISDD	1		1
19(a)	SDD	1		1
19(b)	SDD		2	2
19(c)(i)	SDD		3	3
19(c)(ii)	SDD	1		1
19(d)(i)	ISDD		2	2
19(d)(ii)	SDD	1		1
20(a)(i)	ISDD	1		1
20(a)(ii)	ISDD	2		2
20(b)(i)	ISDD	1		1
20(b)(ii)	ISDD		1	1
20(c)(i)	ISDD	2		2

Qu	Unit	KU	PS	Marks
20(c)(ii)	ISDD		2	2
20(c)(iii)	ISDD	1		1
21(a)(ii)	SDD		3	3
21(a)(ii)	SDD		3	3
21(b)	ISDD		2	2
21(c)	SDD	2		2
22(a)	SDD		3	3
22(b)	SDD		3	3
22(c)	ISDD		2	2
22(d)	ISDD	2		2
		30	60	90

The balance of KU/PS and the balance of content from SDD/ISDD is an exact match with the structure and question types asked in the SQA Specimen Paper for National 5 Computing Science published in 2013.