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9626/12

May/June 2021

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

- Answer **all** questions.
- Use a black or dark blue pen.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use an HB pencil for any diagrams, graphs or rough working.
- Calculators must **not** be used in this paper.

- The total mark for this paper is 90.
- The number of marks for each question or part question is shown in brackets [].

This document has **20** pages. Any blank pages are indicated.

- 1 (a) Tick the most accurate statement referring to the use of a length check when validating data.

	✓
It returns an error message if a data item is not in a lookup list.	
It checks to make sure a data item is within an upper limit and a lower limit.	
It checks that a data item consists of a set number of characters, not more or less.	
It is only used to check numbers.	

[1]

- (b) Tick the most accurate statement referring to the use of a check digit when validating data.

	✓
It is used to check that the data in two fields correspond.	
It checks the number of digits.	
It is the digit added to the end of a long number after a calculation has been performed.	
It checks that a number is above a certain limit.	

[1]

Analyse the effectiveness of the use of type checks and format checks to validate this set of data. Do **not** refer to length checks or check digits in your answer.

[8]

2 Sensors are used in both monitoring and control applications.

- (a) Tick the most accurate statement referring to the use of technology to monitor weather conditions.

	✓
Readings from sensors are not processed before being output.	
A sound sensor is the sensor most frequently used in a weather station.	
Rainfall is measured using a computerised measuring stick.	
Graphs can be produced automatically from a weather monitoring system.	

[1]

- (b) Tick the most accurate statement referring to the use of technology when used in systems which control traffic lights.

	✓
An actuator is the most important input device in such a system.	
The timing sequence of the traffic lights is randomly generated.	
An induction loop is used to detect the presence of an automobile.	
Traffic light systems use moisture sensors to detect the presence of pedestrians.	

[1]

- (c) Describe the inputs, processing and outputs involved in the cooking of a meal using a microprocessor-controlled oven. Include the devices required in your answer.

[6]

- 3 A manager wants to code the data about clothes sold in a shop, ready for storing in a database. The table shows the manager's first attempt.

Category	Data
Colour	Light green (G), Black (B), Dark green (G), Red (R)
Type of clothing	Shirt (S), Skirt (S), Trousers (T), Pullover (P)
Size (ins)	25 – 30 (S), 31 – 36 (L), 37 – 42 (XL), 43 – 48 (XXL)
Brand	Astio (A), Dasiap (D), Utap (U), Gumho (G)

- (a) Give **three** different reasons why the manager wants the data coded.

1

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2

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3

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[3]

- (b) Give **three** different drawbacks of coding the data as shown in the table.

1

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2

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3

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[3]

- (c) Describe **two** different improvements which could be made to this coding system.

1

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2

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[2]

4 Define the following types of malware, including a description of what each type does.

(a) Worm

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..... [3]

(b) Spyware

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..... [3]

- 5 Analyse the effectiveness of using a line graph, compared to a vertical bar chart, for showing shopping trends, using the following data.

2020												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sales (\$)	1050	1120	1180	1150	1140	1160	1170	1190	1180	1200	1190	1220

[6]

- 6** Narinder works as a computer operator for a company which has its own LAN.

(a) Describe the characteristics of a LAN, including the technologies used.

[6]

- (b) The company Narinder works for is in Ghana. Her parents live in Tanzania, a long way from Ghana.

She writes a blog and uses instant messaging to stay in touch with her parents.

Describe **four** other methods by which Narinder could use the internet to communicate with her parents, giving a different drawback of each method.

Method 1

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Drawback

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Method 2

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Drawback

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Method 3

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Drawback

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Method 4

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Drawback

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[8]

- 7 Rajvinder is the regional manager of a team of travelling salespeople. Every month he organises a web-conference for his team.

The necessary equipment and software have already been purchased and tested.

Describe how Rajvinder would set up this web-conference and how his team would join the conference.

[8]

- 8** A common feature of many database systems is the use of switchboards.

Evaluate, by weighing up the advantages and disadvantages, the use of switchboards in such systems.

[6]

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- 9 GoodHope Ltd uses computers to process its payroll. The company pays its workers weekly, which involves the updating of a master file.

Part of a transaction file is shown. It contains workers' ID numbers and the hours worked by those workers in a particular week.

Part of the master file used by the company is shown. It contains the workers' ID numbers and the hourly rate at which they are paid in \$.

Transaction file		Master file	
ID_number	Hours_worked	ID_number	Hourly_rate
25306	35	13487	26
25376	40	25306	25
25891	37	25376	25
27813	40	25891	24
28197	35	26145	25
32678	40	27813	22
33429	37	28197	23
36802	38	31026	22
38439	38	32678	26
39286	40	33429	22
		36802	21
		38439	25
		39286	24
		39875	25

- (a) The transaction file has been sorted so that the updating can begin.

Describe what other process must happen before updating can begin.

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 [1]

- (b)** Describe the steps involved in updating the master file in this payroll system. You must use examples from the files shown. You may assume that the only transaction being carried out is the calculation of the weekly pay using the formula:

Hourly rate $\times$ Hours worked

[8]

10 Many nuclear reactions are simulated rather than being carried out in real life.

- (a) Describe **three** advantages of using a computer-based model to run a simulation for these reactions.

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- (b) Describe **two** disadvantages of using a computer-based model to run a simulation for these reactions.

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- 11 The spreadsheet below shows information about sweets that a shop sells. The data has been formatted but the spreadsheet needs some improvements.

	A	B	C	D	E	F
1	Item	Cost p	Selling	Profit	Amount sold	
2	Nutty	\$1.10	\$1.30	\$0.20	193	
3	Caramel	\$0.95	\$1.10	\$0.15	194	
4	Caramel	\$1.05	\$1.30	\$0.25	171	
5	Choc	\$0.80	\$0.90	\$0.10	181	
6						

- (a) Describe, in detail, what would happen within the spreadsheet if the mouse was double-clicked with the pointer positioned at X.

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..... [1]

- (b) Describe, in detail, what would happen within the spreadsheet if the mouse was double-clicked with the pointer positioned at Y.

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..... [1]

- (c) Originally, the data was entered into the cells in the range B2:C5 as numbers.

Describe the formatting that has been applied to the cells in this range.

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..... [1]

- (d) Validation is to be applied to cells B2 to B5.
This will prevent numbers less than the current minimum value from being entered.
The shop owner will not use a range check or a lookup check.

Name and describe the validation check that will be used.

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..... [2]

Please turn over for Question 12.

- 12 Joanne has created a spreadsheet using proprietary software. Paula has suggested that she should save it in an open-source file format.

(a) Describe **three** distinct features of proprietary software.

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..... [3]

(b) Describe **two** distinct features of an open-source file format.

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