Chapter # 1 – Data, Information, Knowledge and Processing

Specimen 2017

1 **(a)** Describe the difference between data and information.

Answer:

1(a)	**Two** from: Data usually refers to raw data/unprocessed data Information is data that has been processed in such a way as to be meaningful… …to the person who receives it Information is data that has structure and context	**2**

(b) There are different types of data.

Tick **four** correct statements in the following table.

	✓
True and false are examples of Boolean data	
A field containing the value 253 would be a field containing text data	
245.6 is an integer	
All numbers are stored as decimals	
'13 cm' is an example of alphanumeric data	
An integer stored in a field is a form of numeric value	
Currency is a type of numeric data	
A real number is an integer which has already been used in a database	
How many times a student has taken an exam would be stored as a Date/time data type	
A percentage value is usually stored as text as it has a percentage sign	

[4]

Question 1, Part (b)

Answer:

1(b)	Award 1 mark for each correct statement ticked.	4

True and false are examples of Boolean data	✓
A field containing the value 253 would be a field containing text data	
245.6 is an integer	
All numbers are stored as decimals	
'13 cm' is an example of alphanumeric data	✓
An integer stored in a field is a form of numeric value	✓
Currency is a type of numeric data	✓
A real number is an integer which has already been used in a database	
How many times a student has taken an exam would be stored as a Date/time data type	
A percentage value is usually stored as text as it has a percentage sign	

2 There are many ways of changing data to suit a purpose including coding, encoding and encryption of data. Coding data in a field containing the gender of a person, for example, would involve coding 'male' as 'm' and 'female' as 'f'.

(a) Tick the correct statement regarding the coding of data.

	✓
A disadvantage of coding data is that it makes the data very difficult to read and understand	
An advantage of coding data is that it saves storage space	
A disadvantage of coding data is that it becomes much slower to type in the data	
An advantage of coding data is that codes are never complicated	

[1]

Question 2, Part (a) and (b)

Answer:

2(a)	Award 1 mark for correct statement ticked. A disadvantage of coding data is that it makes the data very difficult to read and understand: An advantage of coding data is that it saves storage space: ✓ A disadvantage of coding data is that it becomes much slower to type in the data: An advantage of coding data is that codes are never complicated:	1

(b) Tick the correct statement regarding the encoding of data.

	✓
Encoding data is a form of validation	
Text and numbers are the only data types that can be encoded	
Converting digital data to analogue data is a form of encoding data	
Encoding is done to deliberately conceal the content of the data	

[1]

Answer:

2(b)	Award 1 mark for correct statement ticked. Encoding data is a form of validation: Text and numbers are the only data types that can be encoded: Converting digital data to analogue data is a form of encoding data: ✓ Encoding is done to deliberately conceal the content of the data:	1

Question 2, Part (c)

(c) Tick the correct statement regarding the encryption of data.

	✓
Encrypting data prevents hackers from intercepting it	
Encryption is the conversion of data into a form that cannot be easily understood by unauthorised users	
The two main types of encryption are known as public key encryption and open encryption	
Decryption is the process of further converting encrypted data into another more complicated encrypted form	

[1]

Answer:

2(c)	Award 1 mark for correct statement ticked. Encrypting data prevents hackers from intercepting it: Encryption is the conversion of data into a form that cannot be easily understood by unauthorised users: ✓ The two main types of encryption are known as public key encryption and open encryption: Decryption is the process of further converting encrypted data into another more complicated encrypted form:	**1**

Question 6, Part (a)

6 A shop selling Konia mobile (cell) phones keeps records of all the phones it sells.
The shop only stocks three models but each model has either 32 or 64 GB of memory.
An example of the shop's database is given below.

Customer	Model	Price ($)	Memory (GB)
K Spencer	1278C3	500	32
J Sandhu	1273C6	400	64
M Akhtar	1273C3	300	32
Te Won	1275C6	450	64
B Perez	1275C3	350	32
Espanita di Stefano	1278C6	600	64
B Smith	1275C6	450	64
J Johannson	1275C3	350	32
Su Li	1278C6	600	64

(a) A validation check is needed to make sure that only valid model numbers can be accepted.
Name this validation check and describe how it would work.

Answer:

6(a)	Award 1 mark. Name of validation check: Lookup check Award 1 mark for each correct answer up to a maximum of 3. **Three** from: A table of the three models would be stored Data is entered into a cell with the rule Data is compared to entries in the table If data matches an entry it is allowed/If data entered does not match any of the entries in the table it is rejected	**4**

Question 6, Part (b)

(b) Giving examples, explain how consistency checks could be used to ensure that the data that is entered in the shop's database is valid.

Answer:

6(b)	Award 1 mark for each correct answer up to a maximum of 4. **Four** from: Rule could be that price must match model number If the model number is 1273C3 price must be $300 If the model number is 1273C6 price must be $400 If the model number is 1275C3 price must be $350 If the model number is 1275C6 price must be $450 If the model number is 1278C3 price must be $500 If the model number is 1278C6 price must be $600 Rule could be that memory must match model number If model number ends in 3 memory must be 32 If model number ends in 6 memory must be 64	**4**

June 2017 – P11 & P12

3 A newspaper story is regarded as static data.

Using another appropriate example, describe what is meant by static data.

Answer:

3	***Three*** *from:* 1 mark each Data that does not change It can be read without being written back to a file/not changed when written back Limited amount of information in a static information source… …because as soon as it is created it is difficult to have information added to it Static data tends to go out of date quickly. Appropriate example such as a CD ROM contains static data. 1 mark	**4**

4 Ashraf has used a word processor to type up an essay for his history assignment. He wishes to make sure that there are no errors in the text he has written.

Describe how he could proofread his essay.

Answer:

4	***Four*** *from:* Read the text carefully to find/correct typographical errors/mistakes in grammar/style/spelling Printing a copy is sometimes better than reading on screen Read the essay out loud… …he will hear other problems that he may not see when reading silently He could use a blank sheet of paper to cover up the lines below the one he is reading… …which keeps him from skipping ahead of possible mistakes Use the search function of the computer to find mistakes he is likely to make Search for "it," for instance, if he confuses "its" and "it's", "there" for "their" or "they're" Check separately for each kind of error he is likely to make, moving from the most to the least important Read through once backwards, sentence by sentence Read through again forward to be sure subjects and verbs agree.	**4**

5 A school secretary has just been given some student data to enter into a school's database of student records.
These include student numbers and dates of birth such as:

13542767	14/07/2000
11987643	13/10/2001

In order to ensure accuracy of the input, the data will be validated.
Possible validation checks which could be used are range checks, check digits and format checks.

Analyse the effectiveness of these checks in validating this data.

Answer:

5	To be marked as a level of response: **Level 3** **(7–8 marks)** Candidates will describe each check and give benefits and drawbacks of each check/consider different reasons for using each check. The issues raised will be justified. The information will be relevant, clear, organised and presented in a structured and coherent format. Specialist terms will be used accurately and appropriately. **Level 2** **(4–6 marks)** Candidates will describe each check and give benefits and drawbacks of checks/consider different reasons for using each check although development of some of the points will be limited to benefits or drawbacks. For the most part the information will be relevant and presented in a structured and coherent format. Specialist terms will be used appropriately and for the most part correctly. **Level 1** **(1–3 marks)** Candidates may only describe checks, and give basic reasons. Answers may be simplistic with little or no relevance. There will be little or no use of specialist terms. **Level 0** **(0 marks)** Response with no valid content.	**8**

Question 5

Answer (Continued):

	Answers may include: A range check could only be carried out on the student number if you knew the lowest and highest number. Invalid numbers/non-existent numbers might be entered which are within the range so would be accepted. A range check on each part of the date of birth could be carried out. Would prevent negative days/days greater than 31 being entered. Would prevent months less than 1 or greater than 12 being entered. Would prevent years less than 2000 or greater than 2001 from being entered. Would not prevent dates like 30/02/2000 or 31/06/2000 being entered. Check digit can only be carried out on long strings of numbers – Student number is not really long enough. Check digit would pick up transposed numbers which none of the other checks would. Date of birth is not in correct format for a check digit to be used. Format check could be used on date of birth nn/nn/nnnn. Format check would not pick up nonsensical dates of birth such as 68/99/3000. Format check would pick up data entry errors such as a three digit day/month/single digit day/month/two digit year.	

June 2017 – P13

3 A CD-ROM encyclopaedia is considered to be a static information source whereas a website encyclopaedia is considered to be a dynamic information source.

Explain the differences between static and dynamic information sources.

Answer:

3	***Six** from:* Static information sources are carefully checked for accuracy… …as once the data are used it is difficult to change There is a limited amount of information in a static information source… …as soon as it is created it is difficult to have information added to it A dynamic data source can have information updated quite quickly The data in a dynamic data source is usually up to date/static data tends to go out of date quickly There can be many contributors to a dynamic data source such as a web site… …so the information can be inaccurate.	**6**

10 A school marks all its exams out of 100.
It has recently introduced a system of positive marking for students in years 12 and 13 whereby students will be awarded 10 marks for just sitting the exam and then, as normal, will be awarded further marks for correct answers.
After the papers have been marked, the school secretary will enter the marks into a student database together with the year the student is in and their date of birth, which must be entered in the form dd/mm/yyyy. It is acceptable for data to be omitted for certain students.

Apart from type check or length check, describe **four** different validation checks which should be carried out on the data to help prevent mistakes occurring.

Answer:

10	***Four matched pairs*** *from:* Range check for the exam mark No mark should be less than 10 or greater than 100 Lookup check for year Years should match 12 or 13 Format check for date of birth All dates of birth must be two digits followed by a slash followed by two digits followed by a slash followed by four digits Consistency check on year with date of birth The date of birth can be checked to see that the year the student is in corresponds to that.	**8**

November 2017 – P11 & P12

3 A health inspector, Josefine, is investigating the health of students. She wishes to study the effect on them of traffic on roads passing close to the school. One road seems to be causing more problems than others. She is going to collect data regarding the amount of traffic and its effect on their health.

(a) Describe, with specific reference to the investigation, how she could gather data from direct data sources.

Answer:

3(a)	***Six** from:* She could give questionnaires to students who walk to school using that particular road asking about their general health/number of days missed through illness She could give questionnaires to students who walk to school using other roads asking about their general health/number of days missed through illness She could interview students who walk to school using that particular road asking about their general health/number of days missed through illness She could interview students who walk to school using other roads asking about their general health/number of days missed through illness She could observe/keep a count of traffic coming down the busy road She could observe the amount of traffic/keep a count of traffic coming down the other roads She could use sensors to detect the flow of traffic going down the busy road She could use sensors to detect the flow of traffic going down the other roads She could give questionnaires to residents who live in that particular road asking about their general health She could give questionnaires to residents who live in other roads asking about their general health She could interview residents who live in that particular road asking about their general health She could interview residents who live in other roads asking about their general health.	**6**

Question 3, Part (b) & (c)

(b) Describe the drawbacks of gathering data from direct data sources.

Answer:

3(b)	***Five*** *from:* Data gathering may be expensive as other companies may have to be hired to get it It may involve having to purchase equipment such as data loggers/computers/printers Compared to indirect data sources using direct data sources may be very expensive in preparing and carrying out the gathering of data Costs can be incurred in producing the paper for questionnaires It takes longer to gather data than to acquire data from an indirect data source By the time the project is complete/all the data is collected the data may be out of date The sample size may be small.	**5**

(c) Give reasons why the information that Josefine collects may be inaccurate.

Answer:

3(c)	***Four*** *from:* In questionnaires and interviews the questions may not have been very clear and the respondents may have misunderstood them The questions might have been badly phrased… …so that the respondent thought they knew the answer Josefine wanted – resulting in similar answers from different respondents Questions may have been open-ended allowing the respondent to produce answers which could not be quantified In a multi-choice type question there may not have been a sufficient number of alternatives The respondents selected for the study may not have been very representative There is the possibility that Josefine may have made errors when collecting it Josefine may have made errors when entering the collected data into the computer If the data was collected automatically by sensors the computer/microprocessor may not have been set up properly to accurately interpret the readings.	**4**

Question 3, Part (d) & (e)

The school's students have collected data about cars for a maths project. The teacher has decided to code the data. Here is some of the data. The codes he will use are in brackets.

Colour	Make	Male or female driver	Approximate age of driver
Light blue (B)	Frod (F)	Male (M)	50–59 (50)
Green (G)	Olep (O)	Female (F)	30–39 (30)
Dark blue (B)	Vagen (V)	Female (F)	20–29 (20)

(d) Give **three** reasons why the teacher is planning to code the data.

Answer:

3(d)	***Three** from:* Speeds up data entry Accuracy of entering data is increased When data has been coded it makes it easier to use validation Less storage space is required The smaller the size of the database, the faster it will be to search and produce results.	**3**

(e) Give **three** reasons why the IT teacher has warned against some of the coding the maths teacher plans to use.

Answer:

3(e)	***Three** from:* The code B does not give a clear idea of what shade of blue The approximate age of the driver is too vague/too general… …and would be difficult to use in calculations/graphs There may be many makes of car beginning with the same letter.	**3**

November 2017 – P13

3 Ian wants to apply encryption to all his emails. He is not sure whether to use asymmetric or symmetric encryption.

(a) Describe what is meant by the asymmetric method of encryption.

Answer:

3(a)	***Five** from:* Asymmetric encryption is often referred to as public key encryption The public key is used to encrypt the data… …the corresponding private/secret key is used to decrypt the data The public key is published to everyone… …but the private key is kept secret Anyone with a copy of the public key can encrypt information… …but only the private key holder can read it It is not possible to deduce the private key from the public key.	**5**

(b) Describe what is meant by the symmetric method of encryption.

Answer:

3(b)	***Three** from:* Symmetric encryption only uses a single private/secret key This private/secret key must be shared and kept private by both the sender and the receiver This private/secret key is used for both encryption and decryption To use symmetric encryption sender and receiver must securely share a key before sending/receiving a message.	**3**

March 2017 – P12

1 Tick the **four** most accurate statements regarding the quality of information.

	✓
The more information that is collected the higher its quality.	
Data collected from a third party always becomes high quality information.	
The accuracy of the information collected affects its quality.	
Information which costs a lot to collect is always high quality information.	
A great deal of detail can sometimes lead to poor quality information.	
Irrelevant information leads to poor quality information.	
The problems arising from a lack of good quality information can be overcome by making your filters more refined.	
Good quality of information is always obtained from small groups of people.	
Information collected 100 years ago is always good quality information.	
The more complete the collected information is, the better its quality.	

[4]

Answer:

1	The more information that is collected always improves its quality.	
	Data collected from a third party always becomes high quality information.	
	The accuracy of the information collected affects its quality.	✓
	Information which costs a lot to collect is always high quality information.	
	A great deal of detail can sometimes lead to poor quality information.	✓
	Irrelevant information leads to poor quality information.	✓
	The problems arising from a lack of good quality information can be overcome by making your queries more refined.	
	Good quality of information is always obtained from small groups of people.	
	Information collected 100 years ago is always good quality information.	
	The more complete the collected information is, the better its quality.	✓
		4

2 Tick the **four** statements which most accurately refer to encryption.

	✓
Encryption is used by hackers to discover passwords.	
Encrypting a hard disk prevents viruses from deleting the information.	
Encryption always makes use of a public key and a private key.	
Encryption is the scrambling of the text in a message.	
Encryption is the process of encoding messages in such a way that only authorised parties can understand them.	
Encryption prevents messages from being intercepted.	
Encrypted information can only be understood if decrypted.	
Encryption has speeded up internet browsing by using secure sites.	
The recipient can only decrypt the message with the key provided by the originator.	
All memory sticks are encrypted.	

[4]

Answer:

2		**4**

Encryption is used by hackers to discover passwords.	
Encrypting a hard disk prevents viruses from deleting the information.	
Encryption always makes use of a public key and a private key.	
Encryption is the scrambling of the text in a message.	✓
Encryption is the process of encoding messages in such a way that only authorised parties can understand them.	✓
Encryption prevents messages from being intercepted.	
Encrypted information can only be understood if decrypted.	✓
Encryption has speeded up internet browsing by using secure sites.	
The recipient can only decrypt the message with the key provided by the originator.	✓
All memory sticks are encrypted.	

3 A school secretary has been handed some data by a student:

Prasad, Anoushka, SR132516, 52, 01/09/2000

Explain why they are regarded as just items of data. In your explanation give a possible context for the data and describe how this would make the data become information.

Answer:

3	***Five** from:* They are just a collection of text, numbers and symbols… …with no meaning A possible **context is that the data is about the student** and represents… …their family name, first name, student id, their latest maths mark and their date of birth (**three** marks for five reasonable fields, **two** marks for four reasonable fields, **one** mark for two or three reasonable fields)	**5**

Question 7, Part (c) only

7 Atat Iron Ltd uses computers to process its payroll. The company pays its workers weekly which involves the updating of a master file.

Two sets of data are shown below.
The first set represents part of a transaction file containing workers' ID numbers and the hours worked by those workers in a particular week.
The second set represents part of the master file used by the company. This shows the workers' ID numbers, departments they work in and the rate per hour at which they are paid in Indian Rupees (₹).

Transaction file

Workers_ID_number	Hours_worked
047006	40
486439	40
592786	38
758789	40
512759	37
869891	40
471584	38
131654	40
243303	40
235804	35

Master file

Workers_ID_number	Department	Hourly_rate (₹)
031597	Extrusion	62
047006	Cold rolling	55
131654	Extrusion	62
235804	Foundry	50
239412	Foundry	50
243303	Hot rolling	58
471584	Cold rolling	55
486439	Tube production	65
500368	Extrusion	62
512759	Tube production	65
592786	Foundry	50
758789	Tube production	65
869891	Extrusion	62
942378	Hot rolling	58

Question 7, Part (c) only

(c) When a new worker is added to the master file, the data must be validated. His hourly rate will be 50 Rupees.

Without using a type check, describe **three** other validation checks you would develop to make sure **all** the data entered is sensible.

Answer:

7(c)	Three matched pairs from:	
	Length check on Workers ID number	**1**
	Must be exactly 6 characters long	**1**
	Lookup check on Department	**1**
	Must be one of Foundry, Cold rolling, Tube production, Extrusion or Hot rolling	**1**
	Range check on hourly rate	**1**
	E.g. be between 50 and 65	**1**

June 2018 – P11

1 Tick the **four** most accurate statements referring to the meaning of data and information.

	✓
Data consists of raw facts and figures.	
Information when processed becomes data.	
Data is a collection of text, numbers, symbols, images or sound.	
Data does not need to have meaning to become information.	
Knowing that 159.5, 164.3, 162.9 and 172.3 are the heights in centimetres of pupils in a school makes it a set of data.	
Data cannot be interpreted until it is organised.	
Data is never represented by binary in a computer.	
Data must have a context to become information.	
Data is the result of processing information, usually by computer.	
A group of facts which are used in context is called a set of data.	

[4]

Answer:

1	Data consists of raw facts and figures. ✓ Information when processed becomes data. Data is a collection of text, numbers, symbols, images or sound. ✓ Data does not need to have meaning to become information. Knowing that 159.5, 164.3, 162.9 and 172.3 are the heights in centimetres of pupils in a school makes it a set of data. Data cannot be interpreted until it is organised. ✓ Data is never represented by binary in a computer. Data must have a context to become information. ✓ Data is the result of processing information, usually by computer. A group of facts which are used in context is called a set of data.	**4**

June 2018 – P12

1 Tick the **four** most accurate statements referring to dynamic and static data.

	✓
Dynamic data is data that does not change.	
Data that is read from and not written back to a file is called static data.	
Data stored on a CD ROM is an example of dynamic data.	
Data on a web page that is updated from time to time is an example of dynamic data.	
It is very difficult to add information to a static information source after it has been created.	
There is a limited amount of information in a dynamic information source compared to a static one.	
Dynamic information sources are never checked for accuracy.	
A static information source can have information updated quickly.	
The data in a static data source is always up to date.	
There can be many contributors to a dynamic data source so the information can be inaccurate.	

[4]

Question 1

Answer:

1		4

Dynamic data is data that does not change.	
Data that is read from and not written back to a file is called static data.	✓
Data stored on a CD ROM is an example of dynamic data.	
Data on a webpage that is updated from time to time is an example of dynamic data.	✓
It is very difficult to add information to a static information source after it has been created.	✓
There is a limited amount of information in a dynamic information source compared to a static one.	
Dynamic information sources are never checked for accuracy.	
A static information source can have information updated quickly.	
The data in a static data source is always up to date.	
There can be many contributors to a dynamic data source so the information can be inaccurate.	✓

3 The secretary of a company is transferring workers' records from paper to a new computer database. She wishes to make sure the data in the database is accurate. To check the data she is using verification and validation.

Using an example, or otherwise, explain why she is using validation as well as verification.

Answer:

3	**Six** *from*: Verification is checking that data that has been/is being entered into a computer has been copied correctly from the data source Validation is checking that the data entered is reasonable/sensible Neither method checks that data is accurate/correct Although verification helps to stop users from making mistakes when entering data it cannot check that the data was originally correct Validation is needed because although the data might be copied correctly, the original data might be invalid The date of birth might be in the form dd/mm/yyyy and the data might have been correctly copied as 1994/12/31 but this is not in the correct format… …a format check would have picked this up Common errors when copying data are transcription and transposition errors Verification would pick up a transposition error but most validation checks (except a check digit) would not Verification would pick up transcription errors but validation might not.	**6**

June 2018 – P13

3 When data is entered into a database it needs to be checked for accuracy. One of the methods used to help in this process is verification.

Compare and contrast the different methods used to carry out verification.

Answer:

3	**Five** *from*: Both involve comparing data that has been/is being entered with another copy Both involve checking that data has been entered correctly not that it is correct Visual verification is visually checking the entered data against the source document Double data entry is usually two people entering the data/entered (by the same person) twice (and each version compared against the other) Visual verification is carried out by a human/user/yourself Double data entry – verification is carried out by the computer Visual verification will enable the user to see mistakes if they have been made With double data entry the computer will alert user to the fact that a mistake has been made and they decide which version has been copied correctly.	**5**

4 Jasmine is carrying out a study of the effect of pollution on her local countryside. She intends to use data from direct data sources as well as indirect data sources.

Describe what is meant by direct and indirect data sources using examples from this scenario.

Answer:

4	**Six** *from*: A direct data source is a source where data is collected for a specific purpose or task Examples of direct data sources are questionnaires or data logging An indirect data source is when data is obtained from a third party not necessarily related to the current task *Direct data source* It gives us data that is often called 'original source data' Questionnaires could be distributed amongst farmers and local people asking about the effects of pollution Interviews could be carried out with farmers and local people asking about the effects of pollution Data logging – sensors could be used to gather pollution data that could be processed and interpreted *Indirect data source* Means data that was collected for a particular reason but is then used for another purpose Could collect data from local government agencies which may have pollution data for the local area Could collect data from local environment groups.	**6**

November 2018 – P11 & P13

12 Encoding of data can be thought of as applying a code such as letters, symbols and numbers to data for conversion into a cipher. It can also be thought of as a form of analogue to digital conversion such as used by codec software. At times it is the term applied to the coding of data.

Evaluate the need for encoding data and analyse the different methods that can be used to encode data.

Answer:

12	This question to be marked as levels of response: **Level 3 (7–8 marks)** Candidates will discuss the importance of encoding data including the advantages and disadvantages. Candidates will explain the effectiveness of the main methods of coding in detail. The information will be relevant, clear, organised and presented in a structured and coherent format. There may be a reasoned conclusion/opinion. Specialist terms will be used correctly and appropriately. **Level 2 (4–6 marks)** Candidates will discuss the advantages and disadvantages of encoding data. Candidates will describe the main methods of encoding in detail. For the most part, the information will be relevant and presented in a structured and coherent format. There may be a conclusion/opinion. Specialist terms will be used appropriately and for the most part correctly. **Level 1 (1–3 marks)** Candidates will present advantages or disadvantages of encoding data. Candidates will describe at least one method of encoding in detail. There will be little or no use of specialist terms. **Level 0 (0 marks)** Response with no valid content.	**8**

Question 12

Answer (Continued):

	Candidates may refer to e.g. Coding of data is the reducing the length of data Encryption is the scrambling of data into meaningless groups of symbols Codecs are hardware/software needed to convert data so that it can be transmitted down communication lines Coding: speeds up data entry uses less storage space enables faster searching for data increases the accuracy of data entry data is easier to validate coarsening of data – light blue/dark blue can both have same code Is difficult to code value judgements coding can obscure the meaning of the data	
12	Encryption: It allows protection of sensitive data such as credit card numbers and personal information from computer hackers Without encryption information could be intercepted and altered or misused by outsiders It can be used to create digital signatures to authenticate e-mail If the encryption key is lost the data is effectively lost Encrypting data and creating the keys necessary to encrypt and decrypt the data requires expensive systems Public key encryption is based on complicated mathematics so computers have to work very hard to both encrypt and decrypt data using the system making such systems very slow Many systems use a third party to certify the reliability of public keys and if the certification authority is compromised, the criminal that did it could issue false certificates fooling people into sending data Users can have a false sense of security forgetting that once the data is decrypted it becomes vulnerable to attack again Codecs: Video and music files are large so are difficult to transfer across the Internet quickly Without codecs, downloads would take three to five times longer than they do now There are many different types of codec and it is not always clear which codec to get to play the video/music files It is common to need ten to twelve codecs to play a user's music and movies There is always loss of quality.	

November 2018 – P12

1 Tick the **four** most accurate statements regarding validation and verification.

	✓
Verifying data is checking that data is correct.	
Validating data is checking that data is correct.	
Validation is the process of checking that the data entered into a system is the same as the source data.	
Visual verification is a type of verification.	
A range check is an example of verification.	
Validation is checking that data is sensible.	
A range check is the best check to make sure transposition has not occurred when typing in a bar code.	
Visual validation is a type of validation.	
Double data entry is a type of verification.	
A type check will prevent a letter of the alphabet being typed into a numeric field.	

[4]

Question 1

Answer:

1		4

Verifying data is checking that data is correct.	
Validating data is checking that data is correct.	
Validation is the process of checking that the data entered into a system is the same as the source data.	
Visual verification is a type of verification.	✓
A range check is an example of verification.	
Validation is checking that data is sensible.	✓
A range check is the best check to make sure transposition has not occurred when typing in a bar code.	
Visual validation is a type of validation.	
Double data entry is a type of verification.	✓
A type check will prevent a letter of the alphabet being typed into a numeric field.	✓

Question 8, Part (a) only

8 A secretary has been given a list of product details. She was asked to type the details into a spreadsheet. Unfortunately, when she typed them in, wrong data was entered into cells A7, A10, A16 and B10.

List secretary was given

Product number	Department code
38366614481	B167
14533707617	B132
92648277616	C185
83028907250	A675
99028485231	D132
77662318299	B453
11997211500	E342
71458052066	D543
81391876632	E723
13917086392	Z418
45608392059	M329
54445757756	B132
14050284074	A675
30965517520	E647
43270336250	F341
97118134256	C231

Spreadsheet produced by secretary

	A	B	C	D
1	Product number	Department code		Price
2	38366614481	B167		$383.00
3	14533707617	B132		$145.00
4	92648277616	C185		$926.00
5	83028907250	A675		$830.00
6	99028485231	D132		$990.00
7	76762318299	B453		$767.00
8	11997211500	E342		$119.00
9	71458052066	D543		$714.00
10	8118xy78632	ET23		$811.00
11	13917086392	Z418		$139.00
12	45608392059	M329		$456.00
13	54445757756	B132		$544.00
14	14050284074	A675		$140.00
15	30965517520	E647		$309.00
16	3270336250	F341		$327.00
17	97118134256	C231		$971.00
18				

(a) Describe **four** validation checks which could have prevented these errors from occurring, including a description of how they would have prevented the errors.

Answer:

8(a)	***Check digit check*** for transposed digits in A7 – **1 mark** 67 instead of 76 would have resulted in a different check digit being calculated – **1 mark** ***Type check*** to check for invalid characters in A10 – **1 mark** xy would register as text in a numeric field – **1 mark** ***Length check*** to check exact number of characters entered in A16 – **1 mark** Would have registered that only 10 characters entered – **1 mark** ***Format check*** to check that correct format has been followed in B10 – **1 mark** Would have trapped two letters and two digits entered instead of one letter followed by three digits – **1 mark**	**8**

March 2018 – P12

1 Tick the **four** most accurate statements regarding knowledge, data and information.

	✓
Knowledge is remembering a set of facts.	
5, 10, 15, 20 are examples of information.	
Knowledge is just learning items of data by rote.	
Knowledge never requires the understanding of information.	
Knowledge is the use of information to solve problems.	
Information is data that needs to be processed to give it meaning.	
Understanding that 25 is the fifth answer in the five times table requires knowledge.	
Tacit knowledge is knowledge that is easy to pass on to someone else.	
A list of all the books written by Shakespeare is just raw data.	
Being aware that Pride and Prejudice was not written by Shakespeare requires knowledge.	

[4]

Answer:

1		**4**

Knowledge is remembering a set of facts.	✓
5, 10, 15, 20 are examples of information.	
Knowledge is just learning items of data by rote.	
Knowledge never requires the understanding of information.	
Knowledge is the use of information to solve problems.	✓
Information is data that needs to be processed to give it meaning.	
Understanding that 25 is the fifth answer in the five times table requires knowledge.	✓
Tacit knowledge is knowledge that is easy to pass on to someone else.	
A list of all the books written by Shakespeare is just raw data.	
Being aware that Pride and Prejudice was not written by Shakespeare requires knowledge.	✓

2 Tick the **four** most accurate statements regarding encryption protocols.

	✓
None of the web browsers currently in use support TLS.	
SSL stands for Secure Socket Layer.	
TLS was used before SSL came into being.	
TLS and SSL are protocols that provide security of communication in a network.	
SSL uses asymmetric cryptography only.	
Encryption protocols prevent hackers from intercepting a message.	
TLS stands for Transport Layer Socket.	
Client-server applications use TLS in a network to try to prevent eavesdropping.	
Encryption protocols enable credit card payments to be made securely.	
SSL does not require a handshake to be carried out.	

[4]

Answer:

2	None of the web browsers currently in use support TLS.	**4**
	SSL stands for Secure Socket Layer. ✓	
	TLS was used before SSL came into being.	
	TLS and SSL are protocols that provide security of communication in a network. ✓	
	SSL uses asymmetric cryptography only.	
	Encryption protocols prevent hackers from intercepting a message.	
	TLS stands for Transport Layer Socket.	
	Client-server applications use TLS in a network to try to prevent eavesdropping. ✓	
	Encryption protocols enable credit card payments to be made securely. ✓	
	SSL does not require a handshake to be carried out.	

7 Codecs are used in video conferencing.

Describe how data is transmitted and converted in a video conference.

Answer:

7	***Six** from:* Video-conferencing systems require digital compression of audio and video streams (in real time) The hardware or software that performs compression is called a codec... ... a coder/decoder Compression ratios of 50:1 are achieved The digital stream is subdivided into data packets... ...which are then transmitted through a digital network Each packet has a 'header' that identifies its contents Protocol used is usually determined by the need to have reliable or unreliable communications TCP is a protocol designed for error free transmission of data when delivery needs to be assured TCP will retransmit missing packets when data is lost TCP protocol can cause delays and reduced throughput User Datagram Protocol (UDP) is a less reliable protocol in which any data lost during transmission is not retransmitted Video-conferencing is better suited to UDP than TCP because packets that arrive late would spoil the conference.	**6**

10 A clothing manufacturer uses codes to store information about its clothes. For example, a pair of blue trousers with a waist of 80 cm and a leg length of 77 cm could be coded as BT8077.

Explain what each part of the code GT8878 could mean and why there may be problems with coding other items of clothing in this way. Include in your explanation ways of improving this method.

Answer:

10	***Six** from:* G means grey, T means trousers waist 88 cm and leg length 78 cm G could stand for any colour beginning with G Better to have two or three letters such as GY, GN T could stand for top or T-shirt Better to have two (or three) letters such as TR, TO, TS Waist and leg length could be transposed Better to have W88 or 88W followed by L78 or 78L.	**6**

June 2019 – P11

1 The coding of data refers to using M for male and F for female, for example.

Tick the **four** most accurate statements regarding the coding of data.

	✓
Data becomes easier to interpret	
Coding of value judgements is always very accurate	
The coding of data saves storage space	
Codes cannot be used in a relational database	
It speeds up data entry	
All data can be coded	
There are fewer mistakes when entering data	
Codes are not too complicated so there are never any errors on data entry	
Validation is easier to perform on data	
Coded data makes the computer slower when searching for data	

[4]

Answer:

1		**4**

Data becomes easier to interpret	
Coding of value judgements is always very accurate	
The coding of data saves storage space	✓
Codes cannot be used in a relational database	
It speeds up data entry	✓
All data can be coded	
There are fewer mistakes when entering data	✓
Codes are not too complicated so there are never any errors on data entry	
Validation is easier to perform on data	✓
Coded data makes the computer slower when searching for data	

3 Items of data could be the following:

45612, fred, π, £, ≥ or 

Explain, by describing what is meant by information, why these are just items of data.

Answer:

3	Six from: Data on its own has no meaning Only when it is interpreted does data take on meaning and become information Data consists of raw facts and figures Data has to be processed (into sets) to become information Data needs to have a context in order to become information Data can be in the form of numbers, characters, symbols, images as shown in the example (must have three) Information is what you get after a piece of data is processed and organised and is easily interpretable unlike the examples given Marks are available for explained examples of how data becomes information	**6**

12 A government database stores the licence plates of cars. In this particular country they all follow the same pattern, e.g.

BG136KG
CD125FH
FT342LM
NQ439SR

Apart from a presence check, describe **two** appropriate validation checks which could be applied to licence plates. For each check give an appropriate example of invalid data that would be rejected. Each example must be different.

Answer:

12	Length check to no more or no less than/exactly 7 characters are entered	**1**
	Any suitable example of less than/greater than 7 characters	**1**
	Format check to ensure that all licence plates are two letters followed by three digits followed by two letters	**1**
	Any suitable example not consisting of two letters followed by three digits followed by two letters	**1**

June 2019 – P12

1 Tick the **four** statements referring to asymmetric encryption which are true.

	✓
It is often referred to as public key encryption	
It uses a pair of keys, a public key and a private key	
The public key and the private key are published to everyone who wants to send a message	
Anyone with a copy of the public key can read encrypted data	
It is possible to deduce the private key from the public key	
SSL is a protocol that uses asymmetric encryption	
Keys used in symmetric encryption are longer, compared to asymmetric keys	
Asymmetric encryption is slower to convert than symmetric encryption and requires far more processing power	
Digital certificates are not used with asymmetric encryption	
The use of an asymmetric key algorithm always ensures security of a message	

[4]

Question 1

Answer:

1		4

It is often referred to as public key encryption	✓
It uses a pair of keys, a public key and a private key	✓
The public key and the private key are published to everyone who wants to send a message	
Anyone with a copy of the public key can read encrypted data	
It is possible to deduce the private key from the public key	
SSL is a protocol that uses asymmetric encryption	✓
Keys used in symmetric encryption are longer, compared to asymmetric keys	
Asymmetric encryption is slower to convert than symmetric encryption and requires far more processing power	✓
Digital certificates are not used with asymmetric encryption	
The use of asymmetric key algorithms always ensures security of a message	

4 Some people get confused when trying to establish what is data, information or knowledge. The sequence of numbers 192.168.1.254 could be an example of data.

Using this example, or another of your choice, explain how data, information and knowledge are linked.

Answer:

4	**Four** *from:* Max **three** *from:* Data consists of raw facts and figures as it does not have any meaning until it is processed and given a context Information is data that is assigned a meaning / presented within a context that gives it meaning, relevance and purpose Knowledge is know-how and learning of contextualised information Max **three** *from:* The example does not have a meaning / context The context could be they form an IP address which makes this information Only when it is apparent that IPv4 addresses always consist of four numbers separated by full stops and each number must be between 0 and 255 does this become knowledge Or equivalent statements for their own example (1 for example explained as data, 1 for context explained, 1 for explanation of how it can become knowledge).	**4**

12 Validation is often used to check that data entered into a computer is sensible. A customer orders database contains details of the Customer ID number, the value of the order placed and the date the order was placed. Any new order, when it is entered, needs to be validated.

Using these examples of database fields, analyse the use of the following different validation rules – range check, type check, length check and format check.

Answer:

12	**Eight** *from:* Max **Five** *from:* A range check is used to check that data is within the boundaries of a given range and could be used on the value of the order placed / the date the order was placed Data must be greater than a lower limit and less than an upper limit / day must be greater than 0 and less than 32 / month must be greater than 0 and less than 13 / year must be greater than… and less than… (accept any reasonable example) A type check is used to check that data is of the correct data type and could be used on the value of the order placed / individual components of the date the order was placed Value of order placed must be numeric / components of date must be numeric A format check is to check that the data is in the correct format and could be used on Customer id number / date order placed Customer ID might be in the form of one letter followed by 6 digits / date order placed might be 2 numbers followed by a dash followed by 2 numbers followed by a dash followed by 4 numbers (accept any reasonable example) A length check is to check that data is of the correct length and could be used on the Customer ID number / date order placed Any reasonable example of a length check	**8**

Question 12

Answer (Continued):

	Max **Five** *from:* A range check would not be appropriate for the Customer ID number as it is likely to consist of alphanumeric characters A range check would trap any values outside the range but might not pick up transposition errors A type check would not be appropriate on Customer ID number as the values might not solely consist of digits A type check would trap letters typed instead of numbers but might not pick up values outside a range or transposition errors A format check would not be appropriate on value of order placed as the values in the numeric part might vary in length considerably A format check would trap incorrect formats but might not pick up transposition errors A length check would not be appropriate on value of order placed as the values might vary in length considerably A length check would check the correct length of the data item but would not pick up data of the wrong format or transposition errors.	

June 2019 – P13

3 Using a printed newspaper as an example, describe what is meant by static data.

Answer:

3	**Four** *from:* Static data is data that is unchanged A newspaper contains static data because it is read but not edited / changed by the reader There is limited amount of information in a newspaper / static data As soon as it is printed a newspaper cannot have information added to it In a newspaper information tends to be reliable as it has been checked thoroughly before printing / does not have users / readers able to amend it Static data tends to go out of date quickly / not up to date.	**4**

Question 5, Part (d) only

5 A headteacher is updating the school's record-keeping system. For the new system he is considering using off-the-shelf software. When the new system is running the secretary will need to enter all the students' data. This will require accurate entry of the data.

(d) Describe the different methods of verification the secretary could use.

Answer:

5(d)	**Four** *from:* The secretary enters the data twice The computer stores the data on its hard disk / SSD and compares it with the data that is entered the second time … … generates an error message if the second entry does not match the first Alternatively two people type in the data The computer compares the two versions … … freezing the keyboard if there is a difference Comparing the data on the screen against the original paper document checking for mistakes Printing out a copy of the data and comparing the printout to the original paper document checking for mistakes.	**4**

7 The encoding of data can often require the use of codecs.

Describe the features of this type of encoding.

Answer:

7	**Six** *from:* This type of encoding is used to reduce the size of audio and video files Encoded media file is sometimes similar in quality to the original but has much smaller file size … … however, video compression can be lossy … … the compressed video lacks some information present in the original video … … decompressed video has lower quality than the original as there is insufficient information to accurately reconstruct the original video Each audio and video file format has a corresponding coder-decoder / codec program The codec is used to code it into the appropriate format and then decodes for playback Encoding involves the use of a code to change original data into a form that can be used by an external process Encoding / decoding often refers to the process of analogue-to-digital / digital-to-analogue conversion Can apply to images, audio, video, signals from sensors / control systems.	**6**

Question 8, Part (c) only

8 A car hire company keeps its records in a database consisting of two tables. Parts of these tables are shown below.

Customer Table

CustomerID	FamilyName	FirstName	Phone	Residence
11106	Akula	Angela	01164 960567	Midtown
12481	Onyancha	Udoka	08081 960965	Cheswick
12675	Smith	Wesley	07700 900863	Portlarne
12934	Hall	Lauren	01134 960675	Chorlton
12943	Green	Billy	01164 960001	Midtown
13296	Jones	Trevor	01134 990694	Chorlton
13478	Weston	Wally	07700 900900	Portlarne
13542	Gunn	Jasmine	08081 570945	Cheswick
14632	Wells	Brian	09098 790142	Larrowby
15692	Williams	Ieuan	01164 960836	Midtown
15732	Vercoe	John	09098 980487	Larrowby

Car Table

ID	Make	Model	Engine	Licence	Price	Rental	CustId
1	Olep	Victor	1.8	VSE 648	€19,000	€54	12481
2	Olep	Victor	1.8	VTF 384	€19,000	€54	13478
3	Olep	Fariza	2	BFK 297	€29,000	€63	15692
4	Folkwagon	Cricket	1.4	SB A5526	€15,000	€43	14632
5	Folkwagon	Cricket	1.4	SA V4428	€15,000	€43	13296
6	Folkwagon	Swim	1.2	DD B4978	€11,000	€37	15732
7	Folkwagon	Swim	1.2	DD C8634	€11,000	€37	12934
8	Folkwagon	Piano	1.6	B G8347	€19,000	€49	11106
9	Ranolt	Melanie	1.4	12333 CD 33	€17,000	€41	12943
10	Ranolt	Laine	1.2	6289 XF 54	€11,000	€33	13542
11	Ranolt	Laine	1.2	6301 YU 38	€11,000	€33	12675

Question 8, Part (c)

(c) Explain why it would be extremely difficult to validate the Licence field. Include in your explanation, a detailed description of **three** validation checks, other than a presence check, which could normally be used on any alphanumeric field from the database shown on page 8.

Answer:

8(c)	**Six** *from:* A format check tests to see if the data is in the correct format such as 5 digits followed by a space followed by 6 digits for the Phone field Would be impossible to apply here as all the licence plates all follow a different pattern … … such as 3 letters followed by a space then 3 digits VSE 648, 2 letters followed by a space then 5 characters SB A5526, 4 digits followed by a space then 2 letters then a space then 2 digits 1233 CD 33 A length check tests to see if data is usually exactly a given number of characters such as 5 in the CustomerID/CustId field or 12 in the Phone field Would be difficult to apply here as all the licence plates are different lengths here … … such as 7 for VSE 648, 8 for SB A5526, 11 for 12333 CD 33 Could have a range in the length check but this would not prevent 9 or 10 characters being entered in error – there are no 9 or 10 character licence plates here Lookup check could be used on Make in Car table as there would probably be a limited number of car makes Almost impossible to apply here as there are so many possible licence plate numbers Must have three validation checks to get 6 marks.	**6**

November 2019 – P11 & P13

1 Tick the **four** most accurate statements regarding the benefits of gathering data from direct data sources.

	✓
You only have to gather as much or as little data as you need	
It allows data to be gathered from subjects to which the data gatherer does not have physical access	
You can obtain the data faster than using an indirect data source	
You have full control over the method used to collect the data	
A much larger sample size can be used than is possible with indirect data sources	
A direct data source is quicker to search	
There may be an opportunity to sell the data to other people for them to use	
You do not have to spend time interviewing people or giving out questionnaires	
A CD ROM of historical data is a direct data source	
The source of the data is known exactly, making it easier to judge its reliability	

[4]

Question 1

Answer:

1		4

You only have to gather as much or as little data as you need.	✓
It allows data to be gathered from subjects to which the data gatherer does not have physical access.	
You can obtain the data faster than using an indirect data source.	
You have full control over the method used to collect the data.	✓
A much larger sample size can be used than is possible with indirect data sources.	
A direct data source is quicker to search.	
There may be an opportunity to sell the data to other people for them to use.	✓
You do not have to spend time interviewing people or giving out questionnaires.	
A CD ROM of historical data is a direct data source.	
The source of the data is known exactly making it easier to judge its reliability.	✓

4 Using a news website as an example, describe what is meant by dynamic data.

Answer:

4	**Four** from: Dynamic data refers to data that is changed … The data's state is never expected to be the same when re-input Data on a news website is updated regularly/ as and when necessary/ automatically/often up to date There is an unlimited amount of information in a news website … … it can have information added to it when new facts come to light May be considered by some to be unreliable as data may be not authentic/rumour/may not have been verified/there can be many contributors to a dynamic data source/website so the information can be inaccurate	4

November 2019 – P12

1 Tick the **four** most accurate statements regarding gathering data from indirect data sources.

	✓
It may involve having to purchase more data loggers	
Several people would have to be employed to carry out interviews	
It always takes longer to gather data from an indirect data source	
It is impossible to ensure that data was collected from a representative sample	
The data may be out of date	
The sample size is always smaller than if you used a direct data source	
The purpose for which data was collected originally may be quite different from the purpose of the current research	
There may be no data available. The data required has simply never been recorded	
The coding used in the data is never explained	
Compared to direct data sources, using indirect data sources is always very expensive when preparing and carrying out the gathering of data	

[4]

Question 1

Answer:

1	It may involve having to purchase more data loggers	
	Several people would have to be employed to carry out interviews	
	It always takes longer to gather data from an indirect data source	
	It is impossible to ensure that data was collected from a representative sample	✓
	The data may be out of date	✓
	The sample size is always smaller than if you used a direct data source	
	The purpose for which data was collected originally may be quite different from the purpose of the current research	✓
	There may be no data available. The data required has simply never been recorded	✓
	The coding used in the data is never explained	
	Compared to direct data sources, using indirect data sources is always very expensive when preparing and carrying out the gathering of data	
		4

9 Evaluate the use of HTTPS in websites.

Answer:

9	To be marked as a level of response: **Level 3 (7–8 marks)** Candidates will describe the advantages and disadvantages of HTTPS The issues raised will be justified. The information will be relevant, clear, organised and presented in a structured and coherent format. There will be a reasoned conclusion Specialist terms will be used accurately and appropriately **Level 2 (4–6 marks)** Candidates will describe the advantages and disadvantages of HTTPS although development of some of the points will be limited For the most part the information will be relevant and presented in a structured and coherent format. Specialist terms will be used appropriately and for the most part correctly. **Level 1 (1–3 marks)** Candidates may only address one side of the argument, and give basic advantages/disadvantages Answers may be simplistic with little or no relevance. There will be little or no use of specialist terms. **Level 0 (0 marks)**	**8**

Question 9

Answer (continued):

	Response with no valid content. Candidates may refer to e.g. Disadvantages HTTPS uses a lot of server resources ... ... requires processing power and memory for encryption HTTPS introduces latencies/delays SSL connections take longer to set up with more roundtrips Browser caching does not work properly Modern sites will run slowly without browser caching Need to buy an SSL certificate issued by certificate authorities It is possible to make your own certificate but other users will not trust it so you need to buy one Warnings can arise that despite using SSL a web page is partially serving insecure content The browser may not want users to think a site is totally secure but warning can be off-putting to many users There are proxy caching problems Everything is encrypted including packet headers and content Any caching that might have happened between the points at which data is encrypted and decrypted is blocked	
9	Advantages Messages can't be read by any third-party A certificate guarantees the information a browser is receiving originates at the expected domain It's a guarantee that when a user sends sensitive data, it's being sent to the right place, and not to a malicious third party HTTPS connections make man-in-the-middle attacks much more difficult to execute Search engines list HTTPS websites higher than sites without HTTPS The green padlock indicates that your site provider takes security seriously and this gives users confidence	

March 2019 – P12

3 A student is researching the topic of her new assignment. She has been provided with a series of hard copy magazine articles. She has been told by her tutor that these are probably more reliable than searching the World Wide Web for information.

Compare and contrast the use of these two types of data sources for her research.

Answer:

3	**Six** *from:* Max **five** *from:* Static information sources/magazines are more carefully checked for accuracy Once the data are created they cannot be changed easily There is a limited amount of information in a static information source/magazine/greater amount of information on the World Wide Web As soon as static data source/magazine is created it is very difficult to have information added to it A dynamic data source/website can have information updated quite quickly The data in a dynamic data source/website is usually up to date/ static data tends to go out of date quickly There can be many contributors to a dynamic data source/website so the information can be inaccurate Must have **at least one** from: Both sources require the use of sophisticated analysis techniques Both sources will provide a mixture of relevant and irrelevant information.	**6**

5 A teacher has reminded her students to proof read their assignments before they hand them in.

Define the term 'proof reading'.

Answer:

5	**Four** *from:* Proof reading is the careful reading and rereading of a yet to be finally-printed document To detect any errors and mark corrections It is a relatively slow and methodical search for errors Errors such as spelling mistakes, typographical mistakes and grammatical errors (must have at least two) Also checks for omitted words or word endings It may also involve checking of different elements of a layout Checking headings, illustrations and colours Good description of how proof reading is carried out.	**4**

Question 7, Part (c) only

7 Mumbai Stores is a company which has a chain of shops. The company stores the customers' reference number, and the value of the goods they have purchased, in a transaction file. Any payments the customers have made on their account at the end of the month are also stored in the same file.

Parts of the Transaction file and Master file are shown.

The Goods_bought field contains only the value of goods bought using the account's credit facilities.

The Master file shows the customers reference number, the money they owe from the previous month (Old_balance) and the money they now owe (New_balance).

The New_balance has to be calculated by using the Old_balance, Goods_bought and any Payment made. All these values are in rupees.

Transaction file

Customer_ref_no	Goods_bought	Payment
943201	5500	4000
256431	3800	3800
319852	9200	10000
433303	3200	5200
590871	4300	6800
612759	3700	3700
650897	2300	2300
698915	4000	6600
751654	4400	4400
804782	5200	8200

Master file

Customer_ref_no	Old_balance	New_balance
256431	0	
319852	10000	
433303	5000	
590871	4500	
599812	0	
612759	0	
650897	0	
678945	6800	
698915	2600	
712356	5100	
751654	0	
804782	4200	
943201	0	
963584	2400	

Question 7, Part (c)

(c) Each customer has a credit limit of 20000₹. Customers must make a payment of at least 2000₹ each month.

Using examples from the Transaction file, explain why it would be appropriate to use a range check on one field and a limit check on another field.

Please note, the Customer_ref_no is stored as text.

Answer:

7(c)	**Five** *from e.g.:* Use a range check on the Payment field between 2000 and 20000 As customers must make a payment of at least 2000₹ and customers have a credit limit of 20000₹ Have a limit check on the Goods_bought field as they cannot be more than 20000₹… …customers have a credit limit of 20000₹ It is impossible to spend less than 0₹… …so a lower limit to the range is unnecessary A limit check has only one limit but a range check has two – an upper and lower limit There are alternative answers if fully reasoned.	**5**

13 Encryption can be used to protect data on a hard disk and in emails.

Evaluate the need for this encryption.

Answer:

13	**Level 3 (7–8 marks)** Candidates will describe the advantages and disadvantages of both uses of encryption. The issues raised will be justified. The information will be relevant, clear, organised and presented in a structured and coherent format. Specialist terms will be used accurately and appropriately. **Level 2 (4–6 marks)** Candidates will describe the advantages and disadvantages of both uses of encryption although development of some of the points will be limited. For the most part the information will be relevant and presented in a structured and coherent format. Specialist terms will be used appropriately and for the most part correctly. **Level 1 (1–3 marks)** Candidates may only address one use of encryption, and give basic advantages/disadvantages. Answers may be simplistic with little or no relevance. There will be little or no use of specialist terms. **Level 0 (0 marks)** Response with no valid content.	**8**

Question 13

Answer (continued):

	Candidates may refer to, e.g. Disk encryption: *Advantages* Files encrypted by one user cannot be opened by another user if they do not possess appropriate permissions After encryption a file remains encrypted regardless of where it is moved Encryption can be used on any files including executable files Users with permission to decrypt a file are able to work with the file without experiencing any restrictions/difficulties Other users receive a restricted access notification when they attempt to access the encrypted file *Disadvantages* If the password is lost or reset it becomes impossible to gain access to files on the drive If the operating system fails it becomes impossible to gain access to files If the operating system has to be reinstalled it becomes impossible to gain access to files... ...data can be lost irreversibly	
13	Email encryption: *Advantages* As modern technology becomes more sophisticated, so do hackers so sophisticated encryption is essential Passwords on email accounts are not enough Email providers tend not to automatically encrypt email messages nor attachments Without encryption a person/malware could potentially read someone's emails The recipient's email provider server may not be secured Without encryption, messages can be stored as plain text, making it easy for anyone to read and understand When encrypting emails, the text stored in the message and files are scrambled up both in storage and transit... ...the only way to unscramble and read the content is to use a decryption key *Disadvantages* Hackers can still intercept and delete emails Encrypting emails to a new recipient using a private key requires the key to be sent which can be intercepted by a hacker Managing digital certificates can become complex and time consuming.	