Greek Orthodox Patriarchate School
International - Hanina

مدرسة بطريركيّة
الرّوم الأرثوذكس المقدسيّة
الدّوليّة - حنينا

0417 Past Papers

Chapter 7

Systems Life Cycle

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7 A developer is writing a program to record the results of examinations taken by students in a school.

(a) The program will be tested to make sure that it works.

There are three types of test data that can be used to test a system: normal, abnormal and extreme.

Explain what is meant by normal, abnormal and extreme test data.

Normal .....

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Abnormal .....

.....

Extreme .....

.....

[3]

7(a)	**Normal** Data is within the range of acceptability **Abnormal** **One** from: Data outside the range of acceptability Data that is of an incorrect type **Extreme** Data that is on the boundary/limit of acceptability

4 The table shows a comparison of two different types of fitness tracker. A fitness tracker contains a microprocessor, is worn around the wrist and monitors physical readings of the wearer.

Name of fitness tracker	Flexi-byt 6	FitB 4
Battery life in days	20 days	7 days
Method of internet connection	Bluetooth	WiFi
Water resistant	100 m	10 m
GPS	Y	N
Cost	INR 22 855	INR 10 700

(a) You have been asked to design a poster to show this data for the two fitness trackers.

Describe how you would use **six** different design features to enhance the data in this poster. The poster must be suitable for an audience of adult customers.

1 .....

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2 .....

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3 .....

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4(a)	**Six** from: Different size/style of font for the title/features in the table Clear font colour for the title/text in the table Clear fonts for the title/text in the table Use of bold to highlight keywords Use of italics to highlight keywords Poster fills the page Data is shown in the comparison table/chart More text than images Contrasting colours for font and background colour Use of white space Use of borders to make the text stand out

[6]

11 Parallel running is a type of implementation.

Name and describe **two** other methods of implementing a new computer system. For each one give an advantage and a disadvantage of this method. Your answers must be different in each case.

Method 1.....

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Advantage 1.....

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Disadvantage 1.....

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Two matched from:

Direct changeover – 1 mark
New system replaces existing system immediately/overnight – 1 mark

Disadvantage:
The old system no longer exists therefore all data could be lost – 1 mark

Advantage:
One from:
The benefits are immediate
Costs are reduced as only one set of staff are needed
Less change of error as the new system will be fully tested

Method 2.....

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Advantage 2....

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Disadvantage 2.....

.....

Phased implementation – 1 mark
New system is implemented part by part – 1 mark

Advantage:
If the current part fails then not all the system is lost – 1 mark

Disadvantage:
One from:
More expensive as each part needs to be evaluated before moving on
More time consuming as each part needs to be evaluated before moving on

Pilot running – 1 mark
Whole system is implemented in one branch/one office at a time – 1 mark

Disadvantage:
More time consuming as the changeover is spread out – 1 mark

Advantage:
One from:
If the system crashes/fails then only branch/office is affected
Cheaper as training is carried branch by branch
Less time consuming as training is carried out branch by branch

[8]

10 Tick (✓) the most appropriate method of implementation to match the statements below.

	Direct (✓)	Parallel (✓)	Pilot (✓)
All of the benefits are immediate.			
If the new system fails the whole of the old system is still operational.			
This is the cheapest implementation method.			
The system is implemented in one branch of the company.			

[4]

	Direct	Parallel	Pilot
All of the benefits are immediate.	✓		
If the new system fails the whole of the old system is still operational.		✓	
This is the cheapest implementation method.	✓		
The system is implemented in one branch of the company.			✓

4 Tick (✓) whether the following descriptions of analysing a system refer to **Interviews**, **Observation** or **Questionnaires**.

Description	Interviews (✓)	Observation (✓)	Questionnaires (✓)
This method gives a more reliable overview of the whole system.			
This is more time-consuming than the other methods.			
Questions on this method cannot be expanded upon when being asked.			
With this method the worker cannot remain anonymous.			

[4]

	Interviews	Observation	Questionnaires
This method gives a more reliable overview of the whole system.		✓	
This is more time consuming than the other methods.	✓		
Questions on this method cannot be expanded upon when being asked.			✓
With this method the worker cannot remain anonymous.	✓		

4 Tick (✓) whether the following advantages of analysing a system refer to **looking at existing paperwork**, **observation** or **questionnaires**.

	Looking at existing paperwork (✓)	Observation (✓)	Questionnaire (✓)
This method gives the systems analyst an overall view of the system			
Individuals can remain anonymous			
This method allows information to be collected that cannot be obtained from any other method			
This method gives the quickest analysis of the data			

[4]

	Looking at existing paperwork	Observation	Questionnaire
This method gives the systems analyst an overall view of the system		✓	
Individuals can remain anonymous			✓
This method allows information to be collected that cannot be obtained from any other method	✓		
This method gives the quickest analysis of the data			✓

(c) Before the website became operational it needed to be tested. The web designer created a test plan including module and whole system testing.

Explain the difference between module and whole system testing.

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7(c)	**Four** from: Module testing tests the operation of each module Modules are tested separately Module testing tests the relationships between each module Module testing tests the data passing into and out of the modules Easier to find errors in module testing Whole system testing is carried out after module testing Whole system testing checks that the system works as it is supposed to//matches the user requirements Whole system tests the combined modules

..... [4]

11 An air-conditioning system has been fitted in a hotel bedroom. The air-conditioning system will contain fans which operate at varying speeds.

Identify the devices used in the system from the descriptions given.

(a) This device captures the temperature from the room.

..... [1]

(b) This device changes the data from the microprocessor into a form that can change the speed of the fan.

..... [1]

(c) This output device operates the fan.

..... [1]

Question	Answer
11(a)	Sensor
11(b)	Digital to Analogue Convertor/DAC
11(c)	Actuator/motor

8 When a system is being planned, analysis needs to take place.

Questionnaires and interviews are examples of methods of researching existing systems.

Evaluate, by weighing up the advantages and disadvantages, each of these methods.

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Six from:

Quicker method of answering the questions for questionnaires
Questionnaires can be completed in the respondents own time whereas interviews have to be undertaken at a set time
In interviews need to pay for time off work/employing an interviewer which is expensive
Respondents can remain anonymous on questionnaires whereas interview they cannot
Analysis of the results can be quicker with questionnaires
With interviews the interviewer can direct the questions to give answers they want
People tend not to hand questionnaires back as they can be anonymous
Inflexible in the answers on questionnaires whereas interviews allow for expansion on the answers from the previous question
If the respondent gets stuck with a question, there is no easy way to ask for clarification in questionnaires
If they do not understand the question then they may answer differently to what was needed in questionnaires
In questionnaires questions cannot be modified whereas interviews can add extra questions or go into more depth
The analysis of the data in a questionnaire can be displayed easier/graphed
Both can gather information that can be used for later analysis
Both methods may not be answered honestly

..... [6]

10 The network manager at a school has been asked to develop a student registration system to help staff keep a record of student attendance.

(a) Describe the steps required in the analysis of such a system.

.....

Six from:
Current system is observed
Staff/potential users interviewed
Staff/potential users given questionnaires
Gather information about current system
Existing documents examined
Inputs, outputs and processing of the current system determined
Problems with current system identified
User and information requirements identified
System specification decided
Hardware identified/justified
Software identified/justified

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..... [6]

7 The owner of Tawara Hotels is planning a new computerised booking system. There are ten Tawara Hotels throughout the world. The current booking system allows people to book rooms in any of the Tawara Hotels. He has employed a systems analyst to research the current system and then install the new system.

(a) When analysing the current booking system, the systems analyst must identify the user requirements.

Explain why it is important for the systems analyst to do this.

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7(a)	**Three** from: The systems analyst is creating a system that is just for the client Important to meet the needs of the user; so it is customised Reduces the costs if the new system matches the existing hardware and software More efficient system is produced that does what the users require

[3]

(b) Tick (✓) the relevant stage of the systems life cycle for each of the following activities.

Activity	Analysis (✓)	Development and testing (✓)	Evaluation (✓)
Identifying the problems with the current system			
Comparing the solution with the original task requirements			
Create the file structure			
Identify limitations to the new system and improvements to be made			

Activity	Analysis	Development and testing	Evaluation
Identifying the problems with the current system	✓		
Comparing the solution with the original task requirements			✓
Create the file structure		✓	
Identify limitations to the new system and improvements to be made			✓

(c) Before the new booking system is installed, the systems analyst has to decide on a method of implementation. One method of implementation is pilot running.

Name **two other methods** of implementation and describe **two benefits of each**.

Name.....

Benefit 1.....

.....

Benefit 2.....

.....

Name.....

Benefit 1.....

.....

Benefit 2.....

.....

[6]

7(c)	Direct changeover – 1 mark **Two** from: Benefits are immediate Costs less as fewer staff are needed Costs less as only one system is required Less likelihood of malfunction as system is fully tested Parallel running – 1 mark **Two** from: If new system fails, old system can be used as a back up Possible to gradually train staff Phased changeover – 1 mark **Two** from: If the new system fails, only one part is affected Easier to ensure that part of the system is fully operational before moving onto the next part Possible to train staff in one part of the system, therefore less costly than parallel Possible to gradually train staff

11 Two types of documentation are written when a new computer system is created. Some items only appear in the technical documentation and other items only in the user documentation whereas some items appear in both.

Tick (✓) whether the following items only appear in **Technical documentation**, only appear in **User documentation** or appear in **Both**.

Item	Technical documentation (✓)	User documentation (✓)	Both (✓)
Purpose of the system			
How to save a file			
System flowchart			
Software requirements			
List of variables			
Input format			

[6]

Item	Technical documentation (✓)	User documentation (✓)	Both (✓)
Purpose of the system			✓
How to save a file		✓	
System flowchart	✓		
Software requirements			✓
List of variables	✓		
Input format			✓

7 The owner of a soccer club has employed a systems analyst to create a new computerised system to store details of club members.

The systems analyst starts by researching the existing system. One way he could do this is to interview members of the soccer club.

(a) Discuss the benefits and drawbacks of individually interviewing the members.

.....

Six from:

Benefits

Gives the opportunity for the member to give more honest answers

The questions can be expanded/modified//added to following previous questions/answers

Allows more detailed answers to be given rather than questionnaires

Questions can be explained

Can see the body language

Drawbacks

Takes a long time to interview all the members using this method

Both the members and the interviewer have to be free at the same time

This method is expensive as the system's analysts time is expensive

The member cannot remain anonymous, so they cannot express themselves properly

The member feels that they give comments that the interviewer wants to hear

To gain full marks at least one benefit and drawback must be given ..... [6]

2 A computer system uses two types of documentation: technical and user. Some items only appear in the technical documentation and other items only in the user documentation, whereas some items appear in both.

Tick (✓) whether the following items appear only in **Technical documentation**, only in **User documentation** or in **Both**.

Item	**Technical documentation (✓)**	**User documentation (✓)**	**Both (✓)**
Algorithms			
File structures			
Error messages			
Limitations of the system			
Hardware requirements			
Glossary of terms			

[6]

Item	**Technical documentation (✓)**	**User documentation (✓)**	**Both (✓)**
Algorithms	✓		
File structures	✓		
Error messages		✓	
Limitations of the system			✓
Hardware requirements			✓
Glossary of terms		✓	

6 The manager of a company is planning to create a computerised system and has asked a systems analyst to research the current system. The systems analyst could do this by using a number of different methods, but has chosen to create and send out a questionnaire to members of the company.

(a) Discuss the benefits and drawbacks of sending out questionnaires to members of the company.

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6(a)	**Six** from: **Benefits** Faster to complete all questionnaires than using interviews Cheaper to produce questionnaires than pay/employ an interviewer Individuals can remain anonymous therefore they are more truthful More people can answer the questionnaire than can be interviewed They can fill it in in their own time therefore quicker to complete overall **Drawbacks** Tend not to be popular with users Too inflexible cannot ask follow up questions Users tend to exaggerate their responses as they are anonymous As it's anonymous people may not take it seriously Cannot expand on their answers/limited in their responses To gain full marks at least one benefit/drawback must be given

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..... [6]

(b) The system has been created. As the data is entered into the system it is verified.

Give **two** methods of verification.

1 .....

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2 .....

..... [2]

6(b)	Visual verification Double data entry

(c) Explain why data still needs to be validated even though it has been verified.

.....

Four from:
Data may be out of range but verification does not pick it up
Data may be in the wrong format but verification does not pick it up
Data may be missing from a field but verification does not pick it up
Data may be of the wrong length but verification does not pick it up
Validation checks that the data is sensible which verification does not
Verification only checks that the data has been transferred correctly
Verification only checks that the data matches the original source document
Together they reduce the number of errors in the data

..... [4]

2 An examination is marked out of 100 marks and each mark is recorded as an integer in a database.

Tick whether each of the following is the most appropriate example of **abnormal**, **normal** or **extreme** data.

	abnormal (✓)	**normal** (✓)	**extreme** (✓)
0			
45			
100			
110			

[4]

Question	**Answer**	**Marks**
2		**4**

	abnormal (✓)	**normal** (✓)	**extreme** (✓)
0			✓
45		✓	
100			✓
110	✓		

SPECIMEN PAPER **2020/01**

4 **(a)** Identify **four** components of technical documentation.

1 .....

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2 .....

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3 .....

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4 .....

..... [4]

(b) Identify **two** components of user documentation.

1 .....

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2 .....

..... [2]

Question	Answer	Marks
4(a)	**Four** from, for example Purpose of the system/program Limitations of the system Program listing Program language Program flowcharts/algorithms System flowcharts Hardware requirements Software requirements File structures List of variables Input format Output format Sample runs/test runs Validation routines	**4**
4(b)	**Two** from Purpose of the system Limitations of the system Hardware and software requirements How to load/run/install software How to save a file How to print data How to add records How to delete/edit records Input format Output format Sample runs Error messages Error handling Troubleshooting guide/helpline Frequently asked questions Glossary of terms	**2**

13 Describe **two** methods of verification and explain why verification is needed.

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..... [4]

Question	Answer	Marks
13	Award **one** mark for *Visual verification* Visually comparing typed in data with original source Award **one** mark for *Double data entry* Computer compares two versions of the typed in data **Two** from To check that data has been entered/copied accurately To check to ensure accurate data entry Validation may not pick up that although the data is acceptable it may still be incorrect	**4**

4 A new computer system storing examination results out of 20 is to be tested using a range of test data. Tick whether each of the marks is an example of **normal** data, **abnormal** data or **extreme** data.

	normal	**abnormal**	**extreme**
18			
21			
twenty			
20			

[4]

SPECIMEN PAPER **2016/01**

13 Doctors often use expert systems to diagnose illnesses of patients.

(a) Describe how an expert system diagnoses illnesses.

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..... [4]

(b) Give **two** other uses of expert systems.

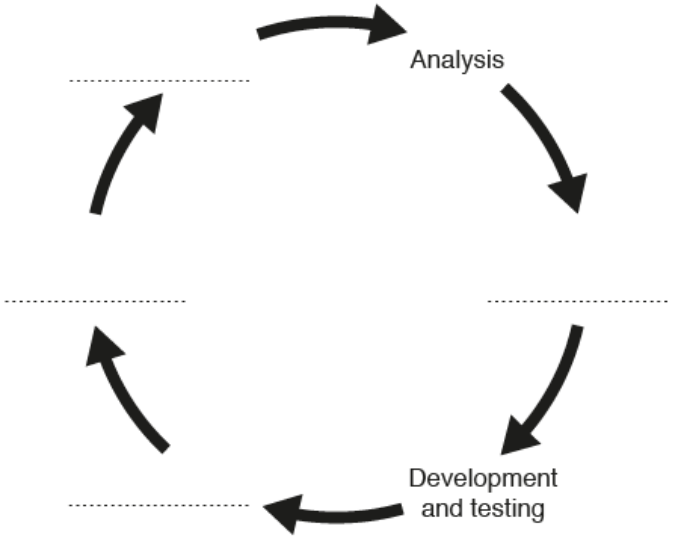
1 .....

2 ..... [2]

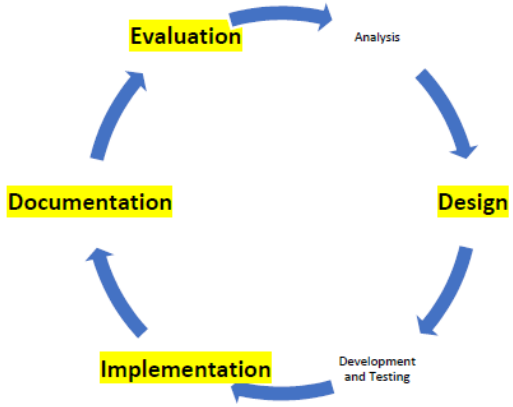
February/March 2019/12

11 The systems life cycle is shown. The Design, Evaluation, Documentation and Implementation stages are missing.

Write these stages into their correct places.



[4]

Question	Answer	Marks
11	 Design Implementation Documentation Evaluation	4

February/March 2019/12

12 Tawara High School has developed a new computerised system to timetable lessons and examinations. The school needs the new system to be in use before the start of the new school year. The school is planning to implement the new system using either direct changeover or parallel running.

(a) Discuss the advantages and disadvantages of using direct changeover compared with parallel running as a method of implementing the system.

In your answer name the method you would use, giving reasons for your choice.

February/March 2019/12

[8]

(b) Describe **four** advantages of using computerised timetabling systems.

1 ....

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2 ....

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3 ....

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4 ....

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[4]

12(a)	Max **three** from: *Advantages* Benefits are immediate whereas in parallel it takes time to fully implement Costs are reduced as there is only one system to maintain but in parallel there are two systems and two sets of workers Less likelihood of bugs as the system will have been fully tested Data only needs to be entered into one system but with parallel running data has to be entered into two systems therefore is more time consuming Max **three** from: *Disadvantages* If the system fails there is no backup but in parallel running if the system fails then the old system is still operational//risk of loss of data Staff have to be trained on the new system as it is implemented with parallel it is possible to train staff gradually. Method chosen: Direct Changeover and max **two** from: Max **two** from: The system will be fully implemented faster than with parallel running There could be data clashes/inconsistencies with two systems operating at the same time Data would be duplicated The school is dealing with external agencies and therefore need single output to these agencies Fewer staff in a school to run two systems	**8**

12(b)	**Four** from: Quicker to find clashes within the timetable Quicker to find the data needed for the timetable Less error prone What ... If scenarios can be set up The data in the timetabling system can be used in other applications automatically Quicker to make changes and print timetables	**4**

May/June 2019/11

2 Tick whether the following examples refer to **verification**, **validation** or **proofreading**.

	verification (✓)	**validation (✓)**	**proofreading (✓)**
Reading through the data without reference to the original copy			
A range check is an example of this			
Checks that data is reasonable			
A way of preventing error when data is copied from one medium to another			

[4]

Question	Answer	Marks
2		4

	verification	validation	proofreading
Reading through the data without reference to the original copy			✓
A range check is an example of this		✓	
Checks that data is reasonable		✓	
A way of preventing errors when data is copied from one medium to another	✓		

May/June 2019/12

10 The systems life cycle is followed when a new computer system is being created.

Tick whether the following statements are examples of the **Analysis** stage, the **Design** stage or the **Evaluation** stage of the systems life cycle.

	Analysis (✓)	Design (✓)	Evaluation (✓)
Identifying the problems with the current system			
Deciding on testing strategies			
Observation of workers using the current system			
Comparing the solution with the original task requirements			

[4]

Question	Answer	Marks
10		4

	Analysis	Design	Evaluation
Identifying the problems with the current system	✓		
Deciding on testing strategies		✓	
Observation of workers using the current system	✓		
Comparing the solution with the original task requirements			✓

May/June 2019/13

12 As student data is entered into a school registration system it needs to be verified.

(a) Name **two** types of verification.

1.....

2.....

[2]

(b) Explain using examples why it is necessary to carry out validation as well as verification for this system.

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..... [4]

Question	Answer	Marks
12(a)	Visual verification Double data entry	**2**
12(b)	Max **three** from: Not all errors are found by either validation or verification separately Source document may contain errors Verification only checks that data is copied correctly Validation only checks if data is reasonable/sensible Max **two** from: Allow any correct example e.g. the mark registered for a student is incorrect on the source document and was copied Correct appropriate explanation of an example of a validation check; e.g. number of lates for a student is 7 misread as a 1; in a range check of 1 – 10	**4**

8 A company called HotHouse Design has produced the following on-screen data entry form to input data into a customer database.

February/March 2018/12

(a) Describe the changes that HotHouse Design could make to their form in order to improve its design and make it more user friendly.

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.....[6]

Question	Answer	Marks
8(a)	**Six** from: Add more navigation/control buttons… …for forward/backward/cancel/clear form Add navigation buttons to make it easier to navigate between pages Cancel/clear button allows the user the clear the form if errors are made Fill the screen with the data Add larger font size Change font colour to contrasting colours Change to appropriate size of the boxes to write in the data Use character boxes for telephone number/ref. No. Better layout on the screen Instructions to enter data	**6**

February/March 2018/12

11 There are two types of documentation, user and technical.

Tick the elements that are part of **User documentation**, **Technical documentation** or **Both**.

	User documentation (✓)	Technical documentation (✓)	Both (✓)
Purpose of the system			
Program listing			
Input format			
Error messages			
Hardware requirements			

[5]

Question	Answer				Marks
11		User documentation (✓)	Technical documentation (✓)	Both (✓)	5
	Purpose of the system			✓	
	Program listing		✓		
	Input format			✓	
	Error messages	✓			
	Hardware requirements			✓	

May/June 2018/11

10 Carlos is designing a new computer system to replace an existing system.

(a) Tick **four** items which will need to be designed.

	Tick (✓)
Inputs to the current system.	
Data capture forms.	
Report layouts.	
Limitations of the system.	
Observation methods.	
Improvements to the system.	
User and information requirements.	
Validation routines.	
Problems with the current system.	
File structure.	

[4]

(b) Before the system is implemented it needs to be tested. Different types of test data are used to test the system. An example of test data is live data.

Describe what is meant by live data.

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..... [2]

(c) Following the implementation of the system, technical documentation needs to be written.

Identify **three** components of technical documentation which are not found in user documentation.

1 .....

2 .....

3 .....

May/June 2018/11

Question	Answer	Marks
10(a)		**4**

	Tick (✓)
Inputs to the current system.	
Data capture forms.	✓
Report layouts.	✓
Limitations of the system.	
Observation methods.	
Improvements to the system.	
User and information requirements.	
Validation routines.	✓
Problems with the current system.	
File structure.	✓

10(b)	This is data that has been used with the current system / data not created for test purposes Therefore the results are known	**2**

Question	Answer	Marks
10(c)	**Three** from: program listing program language program flowcharts/algorithms system flowcharts file structures list of variables test runs validation routines	**3**

May/June 2018/11

15 A new electronic cricket scoreboard is being tested. It stores the number of runs scored by each player during a cricket match. The designer of the scoreboard assumes that no player will score more than 400 runs.

Describe each type of test data shown below giving an appropriate example.

(a) Normal

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..... [2]

(b) Abnormal

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.....

..... [2]

(c) Extreme

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.....

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..... [2]

Question	Answer	Marks
15(a)	Test data any whole number from 0 to 400 Data is within the range / acceptable / valid	**2**
15(b)	Test data any number below 0 / above 400 / letters / decimals Data outside the limits of acceptability / validity	**2**
15(c)	Test data of 0 or 400 Data at the limits of acceptability / validity	**2**

May/June 2018/12

10 The European Space Agency (ESA) is building a new space telescope to orbit the Earth and search for distant galaxies. The ESA is using computer controlled robots to build the lens of the telescope.

(a) Discuss the advantages and disadvantages of using computer controlled robots rather than humans to build the lens.

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..... [6]

(c) When the new system has been developed, both user and technical documentation have to be written.

Name **three** components that are found in both technical and user documentation.

1 .....

2 .....

3 .....

[3]

Question	Answer	Marks
10(a)	Max **four** from: *Advantages* Robots can work in sterile areas where humans would need protective clothing Robots can easily be used for transferring large delicate items Robots can work 24/7 / continuously Cheaper in the long run / robots not paid More accurate as the lens needs to be precise / higher quality of lens More frequent checking of the equipment / lens They do the boring / laborious work Issues can be found quicker Task / job can be carried out far quicker	**6**
	Max **four** from: *Disadvantages* Very expensive to buy / higher in the short term Maintenance is very expensive Difficult to re-program when changes are made Requires backup systems, which are expensive They replace skilled workers, leading to de-skilling They need constant observation which increases the cost of maintenance crews. If something goes wrong, it may be difficult to find the error A mark can be awarded for a reasoned conclusion	
10(b)	**Four** from: Each module has to be tested independently to ensure it functions correctly Modules need to be tested together Data needs to be transferred from module to module to check for data clashes Errors need to be noted and the corrections made … ... then tested again The system as a whole needs to be fully tested under controlled conditions	**4**
10(c)	**Three** from: Purpose of the system / program Limitations of the system Hardware requirements Software requirements Input format Output formats Sample runs	**3**

11 When a system has been developed, two types of documentation are produced, technical and user documentation.

(a) Explain why user documentation is needed.

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..... [2]

(b) Explain why technical documentation is needed.

.....

..... [2]

(c) Identify **four** components that are only found in user documentation but not found in technical documentation.

1 .....

2 .....

3 .....

4 .....

[4]

(d) Tick **three** evaluation strategies that need to be carried out following implementation of the new system.

	Tick (✓)
Observe users operating the old system.	
Compare the final solution with the original requirements.	
Design the report layout.	
Check user documentation to see if it is correct.	
Interview users to gather responses about how well the new system works.	
Test the system works correctly.	
Identify any necessary improvements that need to be made.	
Design error handling.	

[3]

Question	Answer	Marks
11(a)	To help (users) learn/know how to use the software/system To help users to overcome problems	2
11(b)	**Two** from: To help programmers/analysts to make improvements to the system To help programmers/analysts to repair the system To help programmers/analysts to maintain the system	2
11(c)	**Four** from: how to load/run/install software how to save a file how to print data how to add records how to delete/edit records error messages error handling trouble-shooting guide/help line frequently asked questions/FAQ glossary of terms	4
11(d)		3

	Tick (✓)
Observe users operating the old system.	
Compare the final solution with the original requirements.	✓
Design the report layout.	
Check user documentation to see it is correct.	
Interview users to gather responses about how well the new system works.	✓
Test the system works correctly.	
Identify any necessary improvements that need to be made.	✓
Design error handling.	

12 There are two types of verification, visual and double data entry.

Explain the differences between visual verification and double data entry.

.....

.....

.....

..... [2]

Question	Answer	Marks
12	**1 mark** for visual verification and **1 mark** for double data entry Visual verification is a comparison of data with the original data source Double data entry is where data is entered twice and computer compares the two sets of data	**2**

17 A small company makes toys and then delivers them to shops.

Throughout the day orders are received by the company from its customers. The office workers in the finance department create and store an invoice for each order. They are too busy to be disturbed from their work.

Delivery drivers receive copies of the invoices which they will pass on to their customers. The drivers make a large number of deliveries per day and do not return to the office.

A systems analyst will research the current system and suggest improvements to be made.

(a) For each type of employee identified above, describe the most suitable method of collecting information from them, giving a reason for your choice.

Office workers.....

.....

Reason.....

.....

Delivery drivers.....

.....

Reason.....

.....

[4]

(b) The factory is based on one site and only has space for one production line. The company has decided to computerise its production line. It will use direct changeover as the method of implementing the new system.

Explain why the company would use this method rather than other methods of implementation.

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..... [4]

17(a)	*Office workers* Observation of the processes taking place – 1 mark **One** mark from: Enables the systems analyst to see the whole system There are too many workers to interview them all Questionnaires/interviews would stop them working on their tasks OR Looking at existing paperwork – 1 mark **One** mark from: Can see how the files are stored/processes undertaken It allows information to be obtained that cannot be obtained in other ways enables necessary storage, computer equipment to be identified If they are observed, then they may change the way they work They are too busy to be interviewed *Delivery drivers* Questionnaires could be handed out – 1 mark **One** mark from: They can complete them in their own time/at their leisure Questionnaires tend to be more accurate The data can be collated more quickly as everyone can complete at the same time rather than interviewing which is one after the other Individuals remain anonymous therefore they will be more truthful/reliable Easier to analyse	**4**

17(b)	**Four** from: There is only one production line therefore parallel running is not an option There are no branches therefore pilot is not an option Other methods would be more expensive to implement Other methods would take longer to implement The new system needs to be up and running very quickly otherwise orders are lost (as only one production line) Other methods would require more staff and it's a small company	**4**

October/November 2018/11

3 Tick whether the following is a method of **validation**, **verification** or **proof-reading**.

	validation (✓)	**verification (✓)**	**proof-reading (✓)**
Identifying spelling errors			
Using a range check			
Typing in data twice			
Visually comparing data on screen with the original source document			

[4]

Question	**Answer**	**Marks**
3	1 mark for each correct row.	**4**

	validation (✓)	**verification (✓)**	**proof-reading (✓)**
Identifying spelling errors			✓
Using a range check	✓		
Typing in data twice		✓	
Visually comparing data on screen with the original source document		✓	

9 A health authority is planning to centralise its medical booking system. This will allow all medical bookings such as doctors' appointments and hospital appointments to be made online.

The health authority is considering whether to implement the system using Pilot Running or Direct Changeover.

(a) Discuss the advantages and disadvantages of implementing this system using these methods. Include in your answer the method you think the health authority should use, giving a reason for your choice.

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..... [7]

(b) The health authority has implemented the system and it is now in full use. Evaluation now needs to take place.

For each of the following, identify **two** questions that could be asked in order to evaluate the new system.

Efficiency .....

.....

.....

.....

Ease of use .....

.....

.....

.....

Appropriateness .....

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.....

.....

[6]

9(b)	Max **two** from: *Efficiency* Does it operate quicker than the previous system? Does it operate by reducing staff time in making bookings? // Does it reduce the time to make a booking? Does it operate by reducing staff costs? // is it more cost effective than the old system? Max **two** from: *Ease of use* Are all the users able to use the system and make bookings easily/effectively? Are all the users able to change and cancel bookings easily/effectively? Can all staff understand how to use the system with minimal training? Max **two** from: *Appropriateness* Is the system suitable for each of the medical departments? Does it meet the needs of the patients? Does it meet the needs of the medical staff? Does the solution match the original requirements?	**6**

9(a)	Max **five** from: **Advantages** Direct changeover the benefits are seen immediately There is less cost to the Health Authority with direct changeover as only one system is in operation Takes minimal time to changeover using direct changeover therefore the bookings are not disrupted With pilot it is a safer method as it is trialled in one department/centre/branch Only one department/centre/branch affected if system fails If pilot is used it gives staff time to train with new system Fewer errors as it is fully tested Max **five** from: **Disadvantages** Training using direct changeover could be difficult as users cannot be trained on the new system Training with pilot changeover could take place gradually/in direct changeover everyone has to be trained at the same time With pilot there would be two systems in operation therefore there could be confusion No backup of the system using direct changeover For the department/centre/branch using the pilot there is no backup 1 mark is available for the choice of method and a reason: Pilot Changeover as there is less disruption to the system if it does wrong. or Direct changeover this is a cheaper method/immediate results	**7**

October/November 2018/12

10 A local railway company is considering introducing a new system for its passengers using e-tickets on a smart phone. Before introducing this new system, analysis of the current system is required.

(a) Describe the steps that would be carried out in the analysis of the current system.

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..... [6]

The e-ticket will link to a database containing personal data.

(b) Give two examples of personal data that could be stored.

1 .....

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2 .....

.....

[2]

(c) Details of each of the passengers have been entered into the database.

Give **one** reason why this data was verified on entry.

.....

..... [1]

Proofreading is sometimes thought to be verification.

(d) Explain the difference between verification and proofreading.

.....

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..... [2]

Question	Answer	Marks
10(a)	**Six** from: Observation of the current system Interviewing the railway manager Questionnaire to the passengers/railway staff Looking at existing paper work Identify the inputs, processing and outputs of the current system Identify the problems with the current system Identify the user and information requirements/objectives for the new system Identify the hardware and software of the new system	**6**
10(b)	**Two** from, for example: Name (first name and surname) Address Gender Date of birth Mobile phone number Email address	**2**
10(c)	To ensure that the data entered has been copied correctly	**1**

Question	Answer	Marks
10(d)	Proof reading is checking the content of the data for errors Verification is comparing the data with the original	2

October/November 2018/13

3 Tick **three** actions that should be carried out during validation.

	Tick (✔)
Re-reading the document	
Performing a length check on the data	
Re-entering the data	
Performing a character check on the data	
Performing a grammar check on the document	
Checking for spelling	
Checking the data is reasonable and sensible	
Checking the data is 100% correct	

[3]

Question	Answer	Marks
3		3

	Tick (✓)
Re-reading the document	
Performing a length check on the data	✓
Re-entering the data	
Performing a character check on the data	✓
Performing a grammar check on the document	
Checking for spelling	
Checking the data is reasonable and sensible	✓
Checking the data is 100% correct	

5 Peter owns a sports centre. He keeps records of all his customers. He needs to replace his current system and has employed a systems analyst to organise the introduction of the new system.

One method of researching the current system is interviewing Peter.

(a) Describe **three** other methods of researching the current system.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

The systems analyst decides that the new system needs a screen input form to enter all the personal data of each new customer.

(b) Describe **three** items of personal data for new customers that would be entered using the form.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(c) Some users of the system struggle to complete the form due to problems with their eyesight. You have been asked to design a screen input form to help these users.

Describe **four** features that you would include in your form to help these users complete it.

1 .....

.....

2 .....

.....

3 .....

.....

4 .....

.....

[4]

(d) When the computer system has been created it needs to be implemented.

Name **three** methods of implementation.

1 .....

2 .....

3 .....

[3]

5(a)	**Three** from: Questionnaires can be given to users/employees Checking documents from the current system Observation of staff/users	**3**
5(b)	**Three** from: The full/first and second/family name of the customer The contact address of the customer The gender of the customer The date of birth	**3**
5(c)	**Four** from: Appropriate font styles to help the user to read the form by a clearer font Appropriate/larger font sizes to help the user read the form Appropriate spacing between fields to help with the readability of the form Larger character spacing of individual fields to help fill the form in More use of white space to help readability Larger dropdown menus/radio buttons to give options to enter Larger forward/backward/submit buttons to help navigate Darker writing on a light background/lighter writing on a dark background	**4**
5(d)	Direct changeover Parallel implementation Phased implementation	**3**

13 Ana is the planning officer for car parking in Rio de Janeiro city centre. She is planning to upgrade the computerised parking meters. The new parking meters need to be tested. The cost of parking is shown below:

Parking Charges
R$2 up to 2hrs parking R$4 up to 5hrs parking R$10 up to 24hrs parking Maximum parking time is 24hrs.

The customer enters money into the machine and then pushes a button to print a ticket. If a customer enters more money than the charge for a time period, but less than the amount of money stated for the next time period, then a ticket is produced for the lower amount of time but no money is given back. Assume that R$2 is the lowest charge and R$10 is the highest charge.

(a) Explain what is meant by the following three types of test data, using examples of the parking charges.

Normal .....

.....

.....

.....

Abnormal .....

.....

.....

.....

Extreme .....

.....

.....

.....

[6]

Having tested the system with normal and abnormal data Ana needs to test with live data.

(b) Explain what is meant by live data.

.....

.....

.....

..... [2]

Question	Answer	Marks
13(a)	1 mark for each explanation 1 mark for the subsequent data example Normal data: Data that is within the range/boundaries/Acceptable data Examples: between R$2 and R$10 Abnormal data: Data outside the range/boundaries/unacceptable data/invalid data Values less than R$2 or larger than R$10 or text. Extreme data: Data on the boundaries of acceptable data Examples R$2, R$4, R$10	**6**
13(b)	Data that has been used in an existing system Data where the results are known	**2**

February/March 2017/12

14 When a system has been created documentation needs to be produced.

(a) Explain why technical documentation is needed.

.....

.....

.....

.....[2]

(b) Explain why user documentation is needed.

.....

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.....

.....[2]

Question	Answer	Marks
14(a)	Designed to help programmers/systems analysts – 1 mark Any **one** from: …to improve a system …to maintain a system …to upgrade a system	**2**
14(b)	Any **two** from: To help the user understand how the new system works To help the user to learn how to use the new system Technical documentation may be too complex for the user to understand To help the user deal with problems	**2**

May/June 2017/11

6 Validation is a way of checking data in a database.

Name the most appropriate validation check that matches each description below.

Makes sure that the data entered into a field is exactly 10 characters.....

.....

Makes sure that a number lies between 10 and 100.....

.....

Makes sure that the data entered is numeric.....

.....

Makes sure that the date is entered as DD/MM/YYYY.....

.....

[4]

Question	Answer	Marks
6	Length check Range check Type check/Character check Format check/Picture check	**4**

12 The Staywell Community Centre has created a new database which stores the details of each of its members. Each member can choose either swimming or tennis as an activity. The fields in the database are name, address, contact number, gender and activity.

(a) When new members arrive at the centre they need to complete a paper-based form. Design a suitable paper-based form to collect the member's details and the activity they wish to book for.

[5]

(b) Describe **four** changes which could be made to this paper-based form to make it into an online screen form.

1.....

.....

2.....

.....

3.....

.....

4.....

.....

[4]

Question	Answer	Marks
12(a)	Any **three** from: – Heading – Suitable line spacing – Fills the page and looks like a paper based form – Tick box/radio buttons for gender/activity – Character boxes – Use of white space – Signature And 1 mark for three correct fields or 2 marks for all five correct fields	**5**
12(b)	Any **four** from: – Drop down box for the activities – Drop down box for gender – Search button for house number and post code – Use of hyperlinks to link to home website – Use of buttons (2 marks max for naming buttons)	**4**

3 Tick whether the following items are found in **technical** documentation or **user** documentation or **both**.

	technical (✓)	user (✓)	both (✓)
Error messages			
Hardware requirements			
Program listing			
Purpose of the system			

[4]

Question	Answer	Marks
3		4

	technical (✓)	user (✓)	both (✓)
Error messages		✓	
Hardware requirements			✓
Program listing	✓		
Purpose of the system			✓

12 When a new system is being developed analysis takes place. One method of researching the current system is interviewing.

(a) List **three** other methods of researching the current system.

1.....

2.....

3.....

[3]

(b) Describe **two** drawbacks of using interviews.

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..... [4]

Question	Answer	Marks
12(a)	Observation Questionnaire Examination of documents	**3**
12(b)	Any **two** matched pairs: – The interviewee may be uneasy with the questioning… – ….as it is not anonymous – Time consuming to interview all the users… – …the interviewers are carried out one at a time – Both the interviewee and the interviewer have to be free at the same time… – …which can cause time problems – May be a language problem… – …this increases the time explaining all sections – May give an answer they think the interviewer is trying to elicit… – …the interviewer could be biased/leading questions – Disillusioned workers may give an answer that jeopardises the project… – …they could give a biased view/too vocal – They cannot give the answer they want… – …as the interview is not anonymous/due to peer pressure – Costly to the employers… – …time for the worker being off job	**4**

14 There are different ways to check the data that you have entered into a computer system. One of these ways is verification.

(a) Name **two** types of verification.

1.....

.....

2.....

.....

[2]

(b) Proofreading is sometimes thought to be verification.

Explain the differences between verification and proofreading.

.....

.....

.....

..... [2]

Question	Answer	Marks
14(a)	Double data entry Visual verification	**2**
14(b)	Any **one** from: – Visual verification involves the data being compared with the original copy – Double entry involves re-entering the data Any **one** from: – Proofreading only involves reading through the document – Proofreading is looking for spelling mistakes/grammar	**2**

11 Systems can be implemented in different ways; one of these is direct changeover.

Name **three** other methods of implementation. For each method give an advantage when compared with direct changeover.

1 .....

.....

.....

2 .....

.....

.....

3 .....

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.....

[6]

Question	Answer	Marks
11	1 mark for method, 1 mark for appropriate advantage. Parallel running... ...has a backup of the data Pilot running... ...only affects one branch if system goes wrong/other branches can learn from the branch's mistakes Phased implementation... ...if system fails still have most of old system to fall back on …staff can be trained gradually	**6**

Oct/ NOV 2017/11

4 Tick whether the following activities are part of the **Design** or the **Implementation** or the **Evaluation** of a system.

	Design (✓)	Implementation (✓)	Evaluation (✓)
Comparing the outcomes with the original task requirements			
Changing over to the new system			
Identifying any limitations and necessary improvements to the system			
Selecting validation routines			

[4]

Question	Answer	Marks
4		4

	Design (✓)	Implementation (✓)	Evaluation (✓)
Comparing the outcomes with the original task requirements			✓
Change over to the new system		✓	
Identifying any limitations and necessary improvements to the system			✓
Selecting validation routines	✓		

October/November 2017/12

13 A travel agent specialising in adventurous holidays has asked a systems analyst to recommend a new computer system for their records. The systems analyst's first task is to research the current system.

(a) Identify **three** methods of researching the current system.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(b) The company has decided to set up a website to publicise its holidays.

Name **three** appropriate types of object that could be inserted into the web page.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

Question	Answer	Marks
13(a)	Any **three** from: Observation of the users Interviewing the manager Questionnaires given out to users Examination of existing documents	3
13(b)	Any **three** from: Text Static images Moving images/animation/video Sound	3

October/November 2017/13

7 An electricity company has created a new computer system to produce its bills.

After the system was implemented a number of customers complained about very expensive bills.

Each module was tested in the system using validation checks.

(a) Explain what other testing should have been carried out before the system was implemented.

.....

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.....

.....[2]

(b) Prior to implementation the management was undecided over the method of changeover to be used.

Explain why the management would choose direct changeover rather than parallel running.

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.....[3]

Question	Answer	Marks
7(a)	Any **two** from: The whole system should have been tested The operator should have checked the meter reading against the previous one The bill should have been checked before it was sent Linkages between modules should have been tested	**2**
7(b)	Any **three** from: Less expensive as the old system is removed before new one starts with parallel there are two systems There is only one set of workers but with parallel there are two sets and therefore more expensive Benefits are immediate but the parallel old system is phased out when new system is working Don't need to maintain integrity of duplicate set of data, parallel running has two sets of data.	**3**

May/June 2016/12

11 Name and describe **three** methods of implementing a new computer system. For each one describe the type of situation where each method might be used.

1 .....

.....

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2 .....

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3 .....

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[9]

11 **Three** matched triples from:

Direct changeover [1]
New system replaces existing system immediately/overnight [1]
A small organisation which can afford to lose data/where system needs to be up and running very quickly/where the new system has been thoroughly tested [1]

Parallel running [1]
New system runs alongside/together with existing system [1]
An organisation with large amounts of data which would take too long to re-enter / cannot afford to lose data/where time taken/cost to implement is not an issue/where the new system needs to be thoroughly tested [1]

Phased implementation [1]
New system is implemented part by part [1]
An organisation where there are clearly defined separate processes/where the new system needs to be thoroughly tested [1]

Pilot running [1]
(Whole) system is implemented in one branch/one office (at a time) [1]
An organisation where there are several branches all doing the same work)/where the new system needs to be thoroughly tested [1]

[9 max]

May/June 2016/13

4 Different types of test data are used to test a newly developed system.

Complete the following sentences.

(a) Data which is of the correct type is called

..... [1]

(b) Data which is outside a given range is called

..... [1]

(c) Data which is at the boundaries of a given range is called

..... [1]

(d) Data which has been used with the current system and the results are known is called

..... [1]

4	**(a)** Normal data	[1]
	(b) Abnormal data	[1]
	(c) Extreme data	[1]
	(d) Live data	[1]

October/November 2016/11

6 Evaluation is a part of the systems life cycle.

Describe **two** evaluation strategies.

.....

.....

.....

.....[2]

6	**Two** from: Compare the final solution with the user requirements Identify any limitations of the new system Identify any further improvements to the new system Analyse feedback from users of the new system Compare test results from the new system with the old system [2]

7 **(a)** In the answer to a question on verification, a student wrote:

'An example of verification is proofreading'.

Explain why proofreading is not necessarily verification.

.....

.....

.....

.....

.....

.....[2]

(b) Give the name of the type of verification that involves reading the information again.

.....[1]

7 **(a)** **Two** from:
Proofreading often involves reading through the document without referring to the original source document.
This is to check for errors in the typing/spelling/grammar.
Verification involves reading through the document but referring to the original source document.
Verification can involve one person reading the document and a second one re-reading the document.
Proofreading does not involve two people keying in the same data for the computer to compare the versions. [2]

(b) Visual verification/Visual check [1]

16 A company has decided to update its current computer system.

As part of the analysis, name **two** methods they could use to research their existing system. Give **one** advantage and **one** disadvantage of each.

Method 1

……

Advantage

……

……

Disadvantage

……

……

Method 2

……

Advantage

……

……

Disadvantage

……

……[6]

16 Matched sections

Interview

Advantage
The user is more open and honest with the answers
Questions can be added to/extended
Questions can be modified
Can see body language/facial expressions

Disadvantage
Time consuming to complete all the interviews
Expensive due to analyst's time
Not anonymous
Can give answers that they think the interviewer wants
May not be available at the time the analyst is available

Questionnaire

Advantage
Faster to complete all questionnaires
Cheaper to produce questionnaires than pay/employ an interviewer
Individuals can remain anonymous therefore they are more truthful.
More people can answer the questionnaire than can be interviewed.
They can fill it in in their own time.

Disadvantage
Tend not to be popular with users
Too inflexible cannot ask follow up questions
Users tend to exaggerate their responses as they are anonymous.
As it's anonymous people may not take it seriously.
Cannot expand on their answers/limited in their responses

Examining documents of the existing system

Advantage
Information can be obtained which is not possible using other methods.
Can see the scale of the problem easily

Disadvantage
Time consuming to go through the documents
Expensive method as the analyst will have to spend time going through documents.

Observation

Advantage
Reliable data
Better overall view of the whole system/all the inputs and outputs of the system
Inexpensive method as the analyst is only watching the workers.

Disadvantage
Hawthorne effect (describe) [6]

13 A new system has been developed and documentation has been produced. There are two types of documentation; user and technical.

(a) Explain what technical documentation is used for.

.....

.....

.....

.....[2]

13 (a) Two from:

Designed to help programmers/systems analysts…
…to improve a system.
…to maintain a system.
…to upgrade a system. [2]

(b) Give **four** examples of the items found in technical documentation.

1 .....

.....

2 .....

.....

3 .....

.....

4 .....

.....

[4]

(b) **Four** from:

Program coding/listing/piece of code
Name of program language
System flowchart
Program flowchart/algorithm/pseudocode/DFD
List of variables
File structure
Purpose of the program
Purpose of the system
Input format or example
Output format or example
Hardware requirements
Software requirements
Sample runs/test runs
Limitations of the system
Known bugs
Validation routines [4]

5 A new system is being implemented in a company. The systems analyst has a number of ways that the system can be implemented.

For each named method, give an advantage of using the implementation over the others.

Parallel running .....

.....

Direct changeover .....

.....

Phased implementation .....

.....[3]

5 Parallel running

Any **one** from:

If the new system fails then the old system is still running.
There is always a backup of the whole system. [1]

Direct Changeover

Any **one** from:

Saves on the costs as less personnel
Saves the time of implementing the new system
Advantages are immediate [1]

Phased Implementation

Any **one** from:

If the new system fails then most of the old system still in place.
Possible to see if part of the new system works before proceeding [1]

9 WBA is a company that makes little profit. Its newly commissioned ICT system is ready to be implemented. It needs the new system to be in use as soon as possible.

Describe the advantages and disadvantages of using parallel running compared with direct changeover as a method of implementing the system. Choose which of these two methods of implementation WBA should use, giving reasons for your choice.

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.....[8]

9 **Eight** from:

Parallel running – There is always the old system to fall back on in the event of the new system failing/information is not lost/always a second copy/Direct changeover – If things go wrong lose all data/ old system is not available
Direct changeover – benefits are immediately available
Parallel running is more expensive to implement as two sets of workers have to be employed
Direct changeover – less likelihood of errors as system will have been fully tested
Direct changeover is quicker to implement than parallel running
Direct changeover – training is more difficult to organise
Parallel running – training can be gradual

Direct changeover would be more suitable as company probably would not be able to afford to use parallel running
Direct changeover would be more suitable as the company needs it to be implemented quickly

Must have at least one mark for reason for choice in order to gain full marks [8]

May/June 2015/11

8 The owner of a sports club has recently had a new computerised stock control system installed. He employed a systems analyst to research the existing system and then install the new system.

(a) Tick the relevant stage of the systems analysis and design (systems life cycle) for each of the following activities.

Activity	Analysis ✓	Design ✓	Evaluation ✓
Interviewing the users of the new system			
Interviewing the users of the existing system			
Planning the validation routines			
Examining existing documents			

[4]

(b) Before the system was installed, the systems analyst had to decide on a method of implementation.

Name and describe **three** methods of implementation.

Name .....

Description .....

.....

Name .....

Description.....

.....

Name.....

Description .....

..... [6]

(c) When the system was implemented, the system analyst gave some documentation to the sports club owner.

Name **three** items found in the technical documentation of this system.

1. .....

.....

2. .....

.....

3. .....

..... [3]

(d) Name **three** items in the user documentation which are not present in the technical documentation.

1. .....

.....

2. .....

.....

3. .....

..... [3]

8 (a)

Activity	Analysis ✓	Design ✓	Evaluation ✓	
Interviewing the users of the new system			✓	[1]
Interviewing the users of the existing system	✓			[1]
Planning the validation routines		✓		[1]
Examining existing documents	✓			[1]

(b) **Three** names and descriptions from:

Parallel running
Current system and new system run alongside each other

Pilot running
New system introduced in one branch and other branches continue with old system

Direct changeover
New system replaces old system immediately/overnight

Phased implementation
New system is introduced one module/step at a time [6]

(c) **Three** from:
Program listing
Name of program language
Flowchart/algorithm
List of variables
File structure
Purpose of the system/program
Purpose of the program
Input format or example
Output format or example
Hardware requirements
Software requirements
Sample runs/test runs
Known bugs
Validation routines
Limitations of the system [3]

(d) **Three** from:
How to load software/ run software/install software
How to save a file
How to search
How to sort
How to print
How to add records
How to delete/edit records
Troubleshooting guide/contact details/help line/FAQs
Error messages/handling
Tutorials [3]

2 Below is a list of statements. Each statement is true for only one of the given methods of implementation. Tick the method which matches the statement.

	Parallel running ✓	Direct Changeover ✓	Pilot running ✓
All of the old and new systems run at the same time.			
If the system fails in one branch, the rest of the company is not affected.			
The new system has to be completely free of errors before implementation.			
The benefits of the new system are available immediately.			

[4]

2

	Parallel running ✓	Direct Change-over ✓	Pilot running ✓	
All of the old and new systems run at the same time	✓			[1]
If the system fails in one branch the rest of the company is not affected			✓	[1]
The new system has to be completely free of errors before implementation		✓		[1]
The benefits of the new system are available immediately		✓		[1]

4 Tick whether the following items are found in user documentation only, technical documentation only or are found in both.

	User ✓	Technical ✓	Both ✓
Systems flowchart			
How to save a document			
List of variables			
The purpose of the system			

[4]

4

	User ✓	Technical ✓	Both ✓	
Systems flowchart		✓		[1]
How to save a document	✓			[1]
List of variables		✓		[1]
The purpose of the system			✓	[1]

15 One of the stages in systems analysis and design is called development and testing.

Describe the different testing strategies that can be used on a new system.

.....

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.....

.....[6]

15 **Six** from:

Testing modules with abnormal data
Testing modules with data that is outside the range
Testing modules with data that is of the wrong type/format/length
Testing modules with normal data
Testing modules with data that is within the range
Testing modules with data that is of the correct type/format/length
Testing modules with extreme data
Testing modules with data that is at the boundaries/ends of the range
After testing each module thoroughly…
…testing the whole system
Description of user testing
Testing with live data [6]

4 Tick whether the following statements apply to verification, validation or neither.

	Verification ✓	Validation ✓	Neither verification nor validation ✓
Data is entered by two different operators			
Data is checked to see if it is present			
Data is checked to make sure it is correct			
Data entered is checked to see if it matches data on the source document			

[4]

4

	Verification ✓	Validation ✓	Neither verification nor validation ✓	
Data is entered by two different operators	✓			[1]
Data is checked to see if it is present		✓		[1]
Data is checked to make sure it is correct			✓	[1]
Data entered is checked to see if it matches data on the source document	✓			[1]

13 A company has decided to introduce a new computer system. It has employed a systems analyst to oversee this. Her first task is to research the current system.

(a) Identify **three** methods of carrying out this research other than by observation. For each method, give an advantage compared to the other methods.

Method 1 .....

Advantage .....

.....

Method 2 .....

Advantage .....

.....

Method 3 .....

Advantage .....

.....

[6]

(b) The new system will be designed after the current system is analysed.

Identify **three** items which will be part of the design.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(c) Once the system is implemented, the systems analyst will provide documentation for the new system.

Explain why **two** types of documentation are needed.

.....

.....

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.....

.....

.....

.....

.....

.....

..... [5]

13 (a) Interview **[1]**
Can change questions in light of previous answers/interviewer can detect body language **[1]**

Questionnaire **[1]**
Quicker to get every worker's response/easier to collate responses **[1]**

Examining documents **[1]**
Can see exact details of inputs and outputs **[1]**

(b) **Three** from:
- Design of data capture forms
- Design of screen layouts
- Design of report layouts
- Design of screen displays
- Design of validation routines
- Design of data/file structures
- Choice of hardware
- Choice of software **[3]**

(c) **Five** from:
- User documentation needs to be provided
- This will help people use various features of the new system/so users will know/learn how to use the system/learn how to deal with errors
- Features such as how to save/print/enter data/troubleshooting/FAQs, etc. need to be provided
- Technical documentation needs to be provided
- This will help a programmer or systems analyst to upgrade the system
- This will help a programmer or systems analyst to modify the system
- Will contain technical elements such as program listing/flowcharts/lists of variables, etc. **[5]**

4 Tick the **most** appropriate method of implementing a new system for each company.

Company	Parallel running ✓	Pilot running ✓	Direct changeover ✓
A company with several branches wishes to test the new system in one branch only.			
A small company that can only afford to spend a small amount of money on implementing the new system.			
If the whole system fails, the company wishes to return to the original existing system.			
A company that wants the quickest method of implementation.			

[4]

4

Company	Parallel running ✓	Pilot running ✓	Direct changeover ✓	
A company with several branches wishes to test a new system in one branch only.		✓		[1]
A small company that can only afford to spend a small amount of money on implementing the new system.			✓	[1]
If the whole system fails, the company wishes to return to the original existing system.	✓			[1]
A company that wants the quickest method of implementation.			✓	[1]

14 A large company has asked a systems analyst to research the current system.

(a) Describe how this will take place.

.....

.....

.....

.....

.....

.....

.....

.....[4]

(b) Describe what information will be identified as a result of this research.

.....

.....

.....

.....

.....

.....

.....

.....[4]

14 (a) **Four** from:

Users of the current system will be interviewed
Users of the current system will be asked to complete questionnaires
Users of the current system will be observed using the system
Existing documents will be examined
Management will be interviewed
Management will be asked to complete questionnaires [4]

(b) Four from:

Inputs of the current system
Outputs from the current system
Processing in the current system
Problems/limitations with the existing system/improvements required
The user requirements
The information requirements [4]

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13 A company is going to introduce a new computer system.
The company employs drivers to deliver orders and they are rarely in the office for more than a few minutes. The office secretaries process the orders and dislike being interrupted. A manager is in charge of the current system and appointments can be made to see her.

(a) Name **three** methods of researching the current system other than from examining documents.

Identify the workers that each method would be most suitable for. Each method will be used with a different type of worker.

1 .....

.....

.....

2 .....

.....

.....

3 .....

.....

.....
[6]

(b) After the current system has been researched, the new system will be designed. This means that the file structure will be designed.

Identify **three** items of a flat file structure which will form part of this activity.

1 .....

2 .....

3 .....
[3]

13 (a) **Three** matched pairs:

Interview
Manager

Questionnaire
Drivers

Observation
Secretaries **[6]**

(b) **Three** from:

Data type for each field
Appropriate field names
Validation rules
Field lengths
Field descriptions **[3]**

9 Students are using questionnaires to find information about workers at a company. They are going to construct a database to store the results.

Each worker at the company has an individual works number which starts with a letter and has 6 digits e.g. A123456.

Below is part of a questionnaire which some students have created to collect the results.

Company survey

1. What is your works number? | | | | | | | |
2. Do you use a car to drive to work? YES/NO
3. How many hours per week do you work? | | |

(a) Name a suitable data type for the answer to:

(i) Question 1

.....

(ii) Question 2

.....

(iii) Question 3

..... [3]

(b) Name the validation check which would be **most** suitable to ensure that data entered for question 1 of the questionnaire is acceptable.

..... [1]

9 **(a)** **(i)** Alphanumeric/text [1]

(ii) Boolean/logical [1]

(iii) Numeric/integer [1]

(b) Format/picture/length [1]

11 A company is going to replace its existing computer system with a new one.

Put the following steps into the correct order that the systems analyst would follow.

Implement the new system.

Develop the new system.

Collect information about the existing system.

Evaluate the new system.

Design a file structure.

1 .....

2 .....

3 .....

4 .....

5 ..... [5]

11 1. Collect information about the existing system.
2. Design a file structure.
3. Develop the new system.
4. Implement the new system.
5. Evaluate the new system.

5 in correct order = 5
Any 4 in the right order = 4 marks
Any 3 in the right order or position = 3 marks
Any 2 in the right order or position = 2 marks
Collect information… first (the rest wrong) or **Evaluate the system** last (the rest wrong) = 1
Just having one item in correct position (except collect or evaluate) = 0 [5]

19 Paula, a systems analyst, has created a computer system to keep records in a small pharmacy.

(a) Identify **three** types of test data she could use to test the system.

1 .....

.....

2 .....

.....

3 .....

..... [3]

(b) The system will now be implemented.

Apart from speed of implementation, describe **one** benefit and **one** drawback of using the direct changeover method for the pharmacy.

Benefit .....

.....

Drawback .....

..... [2]

(c) The pharmacist will be able to search for details of medicines using the database software.

Describe **four** other database features which will help the pharmacist.

1 .....

.....

2 .....

.....

3 .....

.....

4 .....

..... [4]

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19 (a) **Three** from:
Normal data
Abnormal data
Extreme data
Live data [3]

(b) Benefit – cheaper as only one set of workers needed [1]
Drawback – have no backup system to fall back on [1]

(c) **Four** descriptions from:
Pharmacist can save queries about details of medicines
Pharmacist can create reports of stock
Pharmacist can create charts of sales
Pharmacist can sort medicine records
Pharmacist can enter data using Input forms
Pharmacist can derive costs of re-ordering medicines using calculated fields
Description of how two tables could be linked by the pharmacist [4]

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(d) The new system will be implemented.

Describe **three** different ways in which the system could be implemented.

1 .....

.....

2 .....

.....

3 .....

..... [3]

(d) **Three** from:
Parallel running is running the old and new system together
Direct changeover is stopping the old system and starting the new one immediately
Phased implementation – new system is implemented part by part
Pilot running – system is implemented in one branch/office (at a time) [3]

(e) After the system is implemented the library will be given two types of documentation.

(i) One type will help people use the new system.

Give **two** examples of the contents of this type of documentation.

1 .....

.....

2 .....

.....

(ii) The other type will help a programmer or systems analyst who wants to upgrade the system.

Give **two** examples of the contents of this type of documentation.

1 .....

.....

2 .....

..... [4]

(e) (i) **Two** from:
How to load software/ run software/install software
How to save a file
How to search
How to sort
How to print
How to add records
How to delete/edit records
Purpose of the system
Input format or example
Output format or example
Hardware requirements
Software requirements
Sample runs/test runs
Limitations of the system
Troubleshooting guide/contact details/help line/faqs
Error messages/handling
Tutorials [2

(ii) **Two** from:
Program coding/listing
Name of program language
System flowchart
Program flowchart/algorithm
List of variables
File structure
Purpose of the program
Purpose of the system (only if not mentioned in user documentation)
Input format or example (only if not mentioned in user documentation)
Output format or example (only if not mentioned in user documentation)
Hardware requirements (only if not mentioned in user documentation)
Software requirements (only if not mentioned in user documentation)
Sample runs/test runs (only if not mentioned in user documentation)
Limitations of the system (only if not mentioned in user documentation)
Known bugs
Validation routines [2]

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7 A systems analyst has designed a new computer system for the payroll of a large organisation.

(a) The system needs to be tested.

Using examples of workers pay, which must not be lower than $200 and no more than $800, explain what is meant by normal test data, abnormal test data and extreme test data.

Normal .....

.....

.....

.....

Abnormal .....

.....

.....

.....

Extreme .....

.....

.....

..... [6]

(b) The systems analyst produces documentation for the system.

Give **four** reasons why both user and technical documentation are needed.

1 .....

.....

2 .....

.....

3 .....

.....

4 .....

..... [4]

7 **(a)** Normal data – data within a (given) range/appropriate for that data type [1]
Example – any wage between $200 and $800 [1]
Abnormal data – data outside the range/of the wrong data type [1]
Example – any wage less than $200 or greater than $800 or text such as "two hundred" [1]
Extreme data – data on the boundaries of the range [1]
Example – $200 or $800 [1]

(b) **Four** from:

Technical documentation has to be produced for systems analysts/programmers
Technical documentation to know how to improve/update the system
Technical documentation to know how to repair system
Technical documentation to know how to maintain the system
User documentation so that the user can understand the system
User documentation so that the user can learn/knows how to operate/use/access the system
User documentation so that the user can overcome problems/errors

Must gain at least one mark for each of user and technical to gain full marks [4]

17 Johann Schmidt owns several book shops. He wants to keep details of each book on a computer database. He needs to collect data about each of his books on paper.

Describe **five** features of a well-designed paper based data capture form.

1 .....

.....

2 .....

.....

3 .....

.....

4 .....

.....

5 .....

.....

[5]

17 **Five** from:
Adequate space for response/individual character boxes
Fonts/font size should be easy to read
Instructions how to complete form/clearly labelled field names
Logical order of questions
Questions spaced out/group relevant fields together
Not too much text
Sensible colour scheme
Use of tick boxes
Strikethroughs
Appropriate white space/fills the page [5]

11 The owner of a shop wants a new computer system to store the records of all the stock and customers. The systems analyst will need to find out how the existing system works.

(a) Describe, **in detail**, **two** out of the four possible ways she could find out this information.

Way 1 .....

.....

.....

.....

Way 2 .....

.....

.....

.....

[4]

(b) After analysing the existing system, the systems analyst will design a database.

Identify **four** items that the systems analyst will need to design for the database.

1 .....

.....

2 .....

.....

3 .....

.....

4 .....

.....

[4]

After the system is designed, it will be developed, then implemented.

(c) Name **two** methods, other than direct changeover, that could be used to implement the system and give an advantage for each method compared to direct changeover.

Method 1 .....

.....

Advantage .....

.....

Method 2.....

.....

Advantage .....

.....

[4]

11 (a) **Two** matched pairs from:

Interview users of the existing system
Asking questions about the system face to face/in person

Distribute questionnaires to users of the existing system
Asking questions about the system in hard copy form

Observation of the existing system/workers in action
To see all aspects of the system/whole overview to see how system works

Examining documents about the current system
To see inputs and outputs to the system [4]

(b) **Four** from:
Data capture forms
Screen layouts
Report layout
Screen displays
Validation routines
Data/file structures [4]

(c) **Two** matched pairs from:

Parallel running
There is always the old system to fall back on in the event of the new system failing/training can be gradual

Phased implementation
You still have most of old system to fall back on/training can be gradual

Pilot running
Only one branch is affected if new system fails/other branches can learn from the branch's experiences [4]

14 Students save and carry their work from school to home on a pen drive.

(a) Describe **two** advantages of a pen drive compared to a CD of doing this.

1 .....

.....

2 .....

.....
[2]

(b) Describe **two** disadvantages of a pen drive compared to a CD of doing this.

1 .....

.....

2 .....

.....
[2]

14 (a) **Two** from:
Pen drives are easier to carry than CDs
Most computers have USB ports not all have CD drives
Pen drives store more data than a CD [2]

(b) **Two** from:
Pen drives are more expensive than CDs
Pen drives are easier to lose than CDs
Saving directly to a pen drive can be problematical [2]

When the system was implemented the systems analyst gave some documentation to the sports club owner.

(g) Name **three** different items found in the user documentation.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(g) Three from:
How to load software/ run software/install software
How to save a file
How to search
How to sort
How to print
How to add records
How to delete/edit records
Purpose of the system
Input format or example
Output format or example
Hardware requirements
Software requirements
Sample runs/test runs
Limitations of the system
Troubleshooting guide/contact details/help line/FAQs
Error messages/handling
Tutorials **[3]**

(h) Name **three** different items in the technical documentation which are not present in the user documentation.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(h) **Three** from:
Program coding/listing
Name of program language
System flowchart
Program flowchart/algorithm
List of variables
File structure
Known bugs
Validation routines
Purpose of the program **[3]**

16 Iqbal wants to test the new computerised payroll system he would like to introduce to his company. No company worker is paid less than $100 and no worker is paid more than $500.

Explain what is meant by the following three types of test data using examples of the wages paid to workers.

Normal .....

.....

.....

.....

Abnormal .....

.....

.....

.....

Extreme .....

.....

.....

..... [6]

16	Normal data – data within a (given) range/appropriate for that data type	[1]
	Example – any wage between $100 and $500	[1]
	Abnormal data – data outside the range/of the wrong data type	[1]
	Example – any wage less than $100 or greater than $500 or text example	[1]
	Extreme data – data on the boundaries of the range	[1]
	Example – $100 or $500	[1]

12 A company wishes to replace its current system with a new computerised system. It has employed a systems analyst to investigate the current system.

(a) Describe **three** methods the systems analyst could use to research the current system.

1 .....

.....

2 .....

.....

3 .....

..... [3]

When large volumes of data are input to a new system it is usual to carry out verification and validation on this data.

(b) Name and describe **two** methods of verification which could be used.

Name .....

Description .....

.....

Name .....

Description .....

..... [4]

(c) Explain why it is necessary to carry out validation even though the data has been verified.

.....

.....

.....

.....

.....

..... [3]

12 (a) **Three** from:

Observing the users using the current system
Questionnaires are distributed to users asking questions about the current system
Interviewing the users about the current system
Examining documents from the current system [3]

(b) Visual verification/checking [1]
Read through data on screen and compare with source document [1]

Double data entry [1]
One from:

Data is typed in twice by one typist
Data is typed in by two operators
Computer compares versions [1]

(c) **Three** from:

Source document may contain errors
Verification only checks that data is copied correctly
Verification does not check if data is reasonable/sensible
A correct explanation of an example of one validation check [3]

(b) Boris will provide two types of documentation when the system is implemented.

Name each type of documentation and for each one give **two** items which would be included.

Name .....

Item 1 .....

.....

Item 2 .....

.....

Name .....

Item 1 .....

.....

Item 2 .....

..... [6]

(b) Technical [1]

Two from:

Program listing
Programming language
Flowchart/algorithm
List of variables
File structure
Purpose of the system/program
Input format or example
Output format or example
Hardware requirements
Software requirements
Sample runs/test runs
Known bugs/possible errors
Validation rules
Limitations of the system [2]

User [1]

Two from:

How to load software/install/run software
How to save a file
How to search
How to sort
How to print
How to add records
How to delete/edit records
Purpose of the system/program (only if not mentioned in technical documentation)
Input format or example (only if not mentioned in technical documentation)
Output format or example (only if not mentioned in technical documentation)
Hardware requirements (only if not mentioned in technical documentation)
Software requirements (only if not mentioned in technical documentation)
Sample runs (only if not mentioned in technical documentation)
Error messages (only if not mentioned in technical documentation)
Error handling
Limitations of the system
Tutorials
Troubleshooting guide/Contact details/help line/FAQ [2]

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(b) No CD lasts for longer than 90 minutes or is shorter than 20 minutes. Paul wants to add a field to the database to include this data. He will use test data on this field.

Name **three** types of test data, giving an example of the data which would be used.

Type 1 .....

Example 1 .....

Type 2 .....

Example 2 .....

Type 3 .....

Example 3 ..... [6]

(c) When the system is implemented, documentation will be provided.

Tick **four** items that would be included in the technical documentation but not in the user documentation.

	✓
purpose of the system	
limitations of the system	
program coding	
system flowcharts	
hardware and software requirements	
file structures	
list of variables	
frequently asked questions	

[4]

(b) **Three** matched pairs from:

Normal data
One of:
greater than or equal to 20 and less than or equal to 90

Abnormal data
One of:
greater than 90 or less than 20

Extreme data
One of:
90, 20

[6]

(c)

purpose of the system		
limitations of the system		
program coding	✓	[1]
system flowcharts	✓	[1]
hardware and software requirements		
file structures	✓	[1]
list of variables	✓	[1]
frequently asked questions		

4 A test is marked out of 20 and recorded as an integer. Tick whether each of the fo... marks is an example of **abnormal** data or **extreme** data.

	Abnormal	Extreme
20		
21		
twenty		
0		

[4]

4

	Abnormal	Extreme
20		✓
21	✓	
twenty	✓	
0		✓

[4]

12 Name and describe **three** validation checks which could be carried out on a 16-digit credit card number when it is typed into a computer.

Name .....

Description .....

.....

Name .....

Description .....

.....

Name .....

Description .....

..... [6]

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12 **Three** pairs from:
Length check
Checks there are exactly 16 characters

Invalid character/type check
Checks all characters entered are digits

Check digit
Single digit calculated from other digits appended to these, computer carries out fresh calculation on digit and compares answer with original check digit.

Existency check
Is the card number on the database [6]

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4 An examination is marked out of 100 and the mark is recorded as an integer. Tick whether each of the following marks is an example of **abnormal** data or **normal** data.

	Abnormal	Normal
101		
21		
thirty		
99		

[4]

4

	Abnormal	Normal
101	✓	
21		✓
thirty	✓	
99		✓

[4]

(b) Compare and contrast parallel running and direct changeover as ways of implementing the new database system.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [5]

(b) **Five** from:
Parallel running is running the old and new system together
Direct changeover is stopping the old system and starting the new one immediately
Parallel running is more expensive to implement than direct changeover....
....more expensive as two sets of workers have to be employed
Benefits of direct changeover are immediate whereas this is not the case with parallel running.
Parallel running is slower to implement
If new system fails there is no backup system with direct changeover but there is with parallel running
With parallel running training can be gradual unlike direct changeover which is difficult to organise [5]

13 A teacher has developed a new system for keeping a record of student examination on her laptop and wishes to test it. Each examination is marked out of 50.
Identify **three** types of test data she could use and describe each type using an example.

Type 1 .....

Description .....

.....

Type 2 .....

Description .....

.....

Type 3 .....

Description .....

..... [6]

13 **Three** matched pairs from:

Normal
Within a given range such as 30 out of 50

Abnormal outside the given range or of wrong data type such as 56 out of 50 or 'sixty'

Extreme
At the boundaries of the given range e.g. 0 or 50 [6]