

Revision Questions

Q1. Many computer systems use virtual reality.

(a) Explain what is meant by virtual reality.

- Three-dimensional, computer generated environment
- It can be explored and interacted with, by a person
- Can manipulate objects or perform a series of actions
- Makes use of the sensory experience

Q1. Many computer systems use virtual reality.

(b) Name **two** pieces of hardware used in virtual reality systems.

- Virtual reality headset / head mounted display / Virtual reality goggles
- Speakers / headphone
- The tactile glove
- Joystick / controllers / driving wheel

Q2. Complete the following sentences, using the most appropriate items from the list below.

A 3D printer

An ADC

A compiler

An interpreter

A microphone

A monitor

A numeric keypad

A speaker

A switch

USB

- (a) *A numeric keypad* is a device used to input a PIN.
- (b) *An interpreter* analyses and executes a program line by line.
- (c) *A 3D printer* produces output in the form of solid objects.
- (d) *A speaker* produces output in the form of sound.

Q3. People now tend to buy laptops rather than desktop computers. Despite this, desktop computers are still fairly popular.

Describe three advantages of using a desktop computer rather than a laptop computer.

- As the elements are separate units there is more choice of devices/can be replaced if fails
- Can be easier to upgrade
- Easier to reduce glare on screen as it is separate
- Laptop more expensive for same performance
- Lower chance of it being stolen/lost

Q4. There are many types of printer. Name the printer which best fits the descriptions given below.

- **(a)** A printer that prints by pressing metal pins against an ink ribbon onto the paper
Dot matrix printer
- **(b)** A printer that sprays tiny droplets of ink directly onto the paper
.....
Ink Jet printer
- **(c)** A printer that uses toner to transfer the print image to plain paper
.....
Laser printer
- **(d)** A printer that uses resin to create solid objects
.....
3D printer

Q5. Discuss why different user interfaces require the use of different types of input device.

Command Line Interface

- With a CLI Instructions must be typed to get a computer to carry out an action
- keyboard is used to type
- Typing is key component of CLI
- With CLI syntax has to be precise
- Devices other than a keyboard would be less accurate when entering text

Graphical User Interface

- With a GUI you just click on an icon
- With a GUI icons represent applications
- Separate windows are used for different pieces of work/software
- With a GUI menus are offered to help choose an action
- A mouse can be used to drag windows/icons around a screen
- People with physical disabilities can use a trackerball to manoeuvre the pointer around a screen
- Pointing devices are easier to control a pointer/menu selection/icon clicking
- Buttons on a mouse enable users to see menus on a screen
- Touchscreen can be used to directly select options from a screen

Q6. There are a number of different internal hardware devices. Write down the most appropriate type of internal hardware that fits the following descriptions:

- (a) A volatile device that is used to store data.

RAM

- (b) This is the main printed circuit board found in computer systems.

Motherboard

- (c) A non-volatile chip that stores the start-up commands.

ROM

- (d) This electronic device provides a computer with the ability to produce sounds.

Sound card

Q8. Virtual reality has an impact on everyday life.

(a) Name **two** devices that could be used with a virtual reality system.

- Wand or joystick
- Treadmill
- Pressure mats
- Data gloves
- Headset/head mounted displays/Head mounted device(HMD)
- Goggles
- gaming wheels/consoles
- Pedals
- Paddles
- Cameras
- Motion sensors

Q8.

(b) Virtual reality systems tend to be associated with gaming, but they are used in many different areas in everyday life.

Give **two** uses for virtual reality in everyday life.

- Virtual museums
- Virtual theme parks
- Design of sports clothing
- Flight simulation
- Battlefield
- Virtual tours
- Medical training
- Driving simulation

Q9. Complete the following sentences using the most appropriate words from the list below.

hard disk drive
scanner

hardware
screen

microphone
software

OCR
speaker

printer
virus

(a) The physical components of a computer are called Hardware

(b) The programs and data of a computer are called Software

(c) The device used to input sound is called a Microphone

(d) The device used to store data is called a Hard disk drive

Q10. Tick whether the following statements about internal and external memory are true or false.

	True	False
A portable hard drive is an example of internal memory.		✓
Magnetic tape is used to store backups of data.	✓	
RAM is internal memory.	✓	
ROM loses its data when the power is turned off.		✓

Q11. Computer operating systems have developed since early computers used Command Line Interfaces (CLI). Many computers now use Graphical User Interfaces (GUI), some of which are capable of using touch screen technology. Compare and contrast CLI and GUI.

- Post GUI allows the use of scrolling, expanding
- Post GUI allows the use of touch screen but a CLI does not allow for this
- Icons speed up finding instructions, CLI you have to type out the commands in full
- No editing in CLI
- Due to graphics GUI uses a lot of memory, CLI is a lot smaller program
- The loss of memory affects kinds of applications that can be run
- GUI more user friendly CLI the commands have to be memorised
- GUI has a more varied use on other devices not just computers
- GUI sometimes have CLI embedded within them
- CLI and GUI both carry out file management CLI and GUI use similar utilities
- Both are operating systems
- Both control the hardware and software

Q1. Circle the names of three devices which are used for input.

CD writer

Laser printer

Pen drive

Mouse

Speaker

Touch screen

Remote control

Wide format printer

Q2. Tick whether the following statements are true or false.

	True	False
Answers to multiple choice examination papers can be read using an Optical Mark Reader.	✓	
MICR reads the information on a credit card.		✓
The chip on a credit card is read by a PIN reader.		✓
An RFID chip can be used to track stock.	✓	

Q3. Write down the most appropriate input device which matches the following descriptions:

- **(a)** This is provided with a laptop to imitate the functions of a mouse.

..... Touchpad

- **(b)** This is not a mouse but is used to manoeuvre objects around the screen in computer video games.

..... Joystick/trackerball

- **(c)** This is used to type in text.

..... Keyboard

- **(d)** This is used for direct input of hard copy images.

..... scanner

Q4. Tick whether the following are examples of impact printers or non-impact printers.

	impact	non-impact
Dot matrix printer	✓	
Inkjet printer		✓
Laser printer		✓
3D printer		✓

Q1. Tick whether the following are examples of Magnetic tape, Blu-ray or DVD RAM.

	Magnetic tape	Blu-ray	DVDRAM
Does not require a laser to read the data.	✓		
Uses serial access only.	✓		
Used to store and play HD movies.		✓	
Can store and read data at the same time.			✓

Q3. Laptop computers are often equipped with Solid State Drives (SSD) or Hard Disk Drives (HDD).

(a) Give four advantages of SSD compared to HDD.

- The SSD is lighter in weight than the HDD therefore the laptop will be lighter and more portable
- The speed of access in SSD is a lot quicker
- The speed of data transfer in SSD is a lot quicker
- There is less chance of the data becoming corrupted as it can save whilst the laptop is moving
- It is a smaller device therefore the laptop will be smaller/thinner
- SSD uses less energy
- Less chance of impact damage

Q2. A new employee of a company is required to log on to the company's computer system and will need to create a suitable password.

(a) Give three rules that the company would have in place, to help the employee choose a password.

- Use of strong passwords
- Do not use pet names
- Do not use personal information
- Do not use birthdates
- Do not use a password they have used before
- Do not use company name

(b) He changes his password to R4hB5&Fg1
Explain why he has chosen this password.

- Conforms to company rules
- Hard to guess
- Stop shoulder surfing
- Hard to crack

(c) When a password is changed it is verified. Identify the type of verification which is carried out.

Double data entry

Q3. Complete each sentence below using the most appropriate item from the list.

a bridge
a printer

a hub
a router

a keyboard
a scanner

a microphone
a sensor

a mouse
a switch

- **(a)** A network device which broadcasts data passing through it is called
• a hub
- **(b)** A network device that connects a LAN with the internet is called
• a router
- **(c)** A network device that connects a LAN to another LAN using the same protocol is called
• a bridge
- **(d)** A network device that learns which devices are connected to which ports is called
• a switch

1: The use of computers has led to some employees changing their working patterns.

Complete the following sentences.

- **(a)** Two or more employees doing the same job but working at different times is called **job sharing**
- **(b)** When a person is employed to work fewer hours than the normal working week, this is called **part-time working**
- **(c)** When employees work the full normal hours in a week but work at times which suit them and the employer, this is called **working flexible hours**
- **(d)** When an employee works the full normal hours in a week but works fewer days, this is called **working compressed hours**

2: For each of the statements below, identify the health problem most likely to be associated with them and a possible solution to the problem. Your answers should be different in each case.

	Health problem	Possible solution
Prolonged use of the Keyboard	RSI/carpal tunnel syndrome	Use a wrist rest Regular breaks to relax the hands Stretching exercises Use of an ergonomically designed keyboard
Looking at a monitor for a long period of time	Eye strain/headache/dry eyes	Resting the eyes by looking in the distance Cutting down on glare Making sure the screen is at eye level Use of blue screen technology Use of flat screen technology
Sitting too long in one position	Back problems/DVT	Foot rest Taking breaks Ergonomic/adjustable chair

3: (a) Identify two different types of job where employment has decreased. As a result of the introduction of computers into the workplace

- Payroll workers
- Typing pool workers
- Car production workers
- Checkout operators
- Bank workers

4: There are many microprocessor controlled devices used in the modern home.

Describe two drawbacks in terms of lifestyle changes this has produced for the users of such devices.

- Can lead to unhealthy eating due to dependency on ready meals ...
- Can lead to laziness / Lack of fitness/exercise / Manual household skills are lost.

5: Name three health problems associated with the prolonged use of IT equipment, and for each one, suggest a possible method to prevent the problem. The methods should be different in each case.

- **Problem:** Eye problems/strain
- **Method:** Take regular breaks/use no-flicker screens/LCD/TFT screens/have eyes tested
- regularly/turn the brightness down/use blue screen/screen filters/blue glasses
- **Problem:** Back pain
- **Method:** Use ergonomic chairs/use foot rests/regular breaks/sit with good posture/height adjustable chairs
- **Problem:** RSI/finger pains
- **Method:** Ergonomic keyboards/regular breaks/less use of mouse/use trackerballs/wrist rest
- **Problem:** RSI/wrist pains
- **Method:** Hands-free/less use of the mobile phone/wrist rest

6: You use a computer to do your homework. You are concerned about the health issues of using a computer.

Discuss the advantages and disadvantages of different methods you could use to help minimise the health problems of using the computer.

Advantages

- If you use a screen filter/blue glasses eye strain is reduced
- If LCD/TFT screens are used then eye strain is reduced
- If my eye is level with the top of the screen it will reduce eye strain/neck ache
- If I take breaks from excessive clicking on the mouse/keyboard this reduces RSI
- Using voice activated systems reduces RSI
- If I use a wrist rest/an ergonomic mouse it will reduce RSI
- If I use an ergonomic chair it will reduce back ache
- If I do not use the computer for long periods of time this will reduce RSI/back ache/eye Neck pain

Disadvantages

- – Turning the screen can reduce your ability to see clearly on the screen
- – Laptops can be difficult to ensure the screen is 90 degrees as the whole unit needs to be moved
- – The cost of safety equipment can be expensive
- – Using voice activated systems can be prone to many errors which may increase RSI correcting them
- – Users can become over-reliant on equipment
- – With laptops/screens it can be difficult to position it so the eye level is at the top of the screen
- – Taking breaks every hour can increase the work time

Q1. An electric bus system is being considered for New Delhi. Passengers will use smart cards to travel on the bus. They will have to add money to their smart card before they can travel.

(a) Compare and contrast the use of smart cards rather than using cash to pay for a journey.

Similarities

- Both used for transactions
- Both are portable
- Both allow payment at point of use

Differences

- Faster process/reading using the card
- Someone needs to check correct payment made with cash/card is automatically checked
- May not have enough money on the card and may not know this
- When the money has run out on the card it cannot be used until it is topped up
- A card can be blocked when stolen
- If you pay by cash you know how much you have paid/no double payment
- No physical cash with a card so less chance of stealing by employees

The new electric bus system will help to reduce the air pollution in the city. Sensors are used in the system.

(b) Name a sensor that could be used to detect high levels of air pollution.

- Nitrogen oxide (sensor)
- Light (sensor)
- Gas (sensor)
- CO₂ (sensor)
- pH (sensor)

(c) The sensor monitors the air pollution. When the air pollution reaches a certain limit, a message is displayed on a street sign in the city to warn pedestrians and road users.

Describe the computer processing involved in this system.

- The microprocessor has a stored value/preset
- Data from the sensor is compared with the preset value
- If the reading is higher than the preset value
- Microprocessor sends signal to the street sign
- If the reading is lower than the preset value nothing happens / if warning sign is lit; it is switched off

(d) Data from the sensor needs to be converted from analogue to digital before it is processed.

Explain the need for this conversion.

- Sensor only reads analogue data
- Microprocessor only reads digital data

A drone is a remote controlled flying vehicle. A drone is being used to monitor floods in Mumbai.

(a) Complete the following sentences, using the most appropriate word or words from the list below.

buzzer
ROM

joystick
speaker

monitor
temperature sensor

pressure sensor
video camera

- (i) The drone is microprocessor controlled with input from ajoystick.....
- (ii) Images of the floods are captured using avideo camera.....
- (iii) The images sent from the drone are displayed on amonitor.....

(b) Name three advantages of using a drone to monitor the floods rather than collecting the data manually.

- Data is continuously sent back to the operator/whereas a person would collect it and send it back
- The drone can work in hazardous conditions
- Drones get a wider view of the flood
- Can go where people cannot

* In certain countries, the RFID chip in a passport is scanned when the passport is presented at an automated passport control gate.
(a) Give **three** items of information about the passport holder that are stored on the RFID chip.

- Passport number
- Date of birth
- Place of birth
- Nationality
- Issue date
- Expiry date
- Facial characteristics/photograph/fingerprint/retina scan
- Biometric measurements (face)
- Signature
- Gender
- Place of issue

(b) Describe how RFID technology reads the details from the chip.

- The chip is presented near a computer with a radio-frequency scanner
- The scanning antenna puts out radio-frequency signals in a relatively short range.
- It provides a means of communicating with the transponder/the RFID tag
- The scanning device provides energy...
- ...so that the chips can broadcast the information in them...
- ...for the computer to read.

(c) Explain why RFID technology is used for reading data from passports.

- More secure than a traditional passport as RFID data difficult to forge
- Counterfeits can be more easily identified than non-RFID passports
- More rapid flow at security check points/quicker than reading it manually

* Many car parks are now fitted with CCTV that can read car number plates.

(a) Explain how number plate recognition systems work.

- An image is taken of the front of the vehicle
- An algorithm isolates the number plate from the image
- Colour brightness and contrast are changed to make the number plate easier to read
- Each character is read using OCR software
- Each character is decoded using OCR software
- Number plate and date/time data is stored in a database
- The number plate is searched in the database
- Comparison is made with number plates stored in the database
- Identifies the car

(b) Describe **two** problems that could occur when the system reads a number plate.

- Another vehicle/pedestrian could obstruct the view of the camera
- The number plate may be too dirty to read
- The number plate may use illegal characters/font
- It may be a motor cycle with the number plate side on/at the back
- Characters are misread – e.g. 0 and O, 1 and I, 2 and Z

* Gabriel is planning a holiday. He is booking his flights through an online booking system.

Discuss the advantages and disadvantages of using online booking systems.

Advantages

- Prevention of double booking
- The data is updated immediately
- The person booking the seats knows immediately if the seat is taken
- The successful booking is known immediately
- Bookings can be made 24/7
- There are more booking lines than in a manual booking system
- The customer needs to add an email address therefore special offers/promotions can be sent from time to time
- Easier to see which tickets are available using onscreen plans/colour coding used for booked and different seat prices
- Easier to reserve seats than in a manual booking system
- E-tickets can be produced therefore less chance of tickets being lost in the post.

Disadvantages

- The customer needs an email address
- The customer needs a debit/credit card
- Requires the customer to have a smartphone for e-tickets
- Customers need an internet connection
- Expensive to set up/maintain
- More difficult to cancel a booking
- Server crash or too many bookings can cause long delays
- Manual system cannot be used as a backup
- Easier to make mistakes in the booking

* Smartwatches can be used in remote regions of the world. These can have an in-built GPS system to help the wearer to locate their position and therefore help with navigation.

(a) Explain how GPS is used to display their location on the watch.

- The smart watch picks up radio signals
- At least three satellites are used
- Satellites transmit/send radio signals to the Earth
- Software in the smart watch interpret the signals
- smart watch is located/display the location on the smartwatch screen

(b) Describe the advantages of using a navigation system with GPS rather than printed maps in this scenario

- The wearer does not have to carry maps of the area//more portable
- More up to date than printed maps
- Navigation errors are reduced as the satellite gives pinpoint accuracy
- The system can be used to calculate an accurate route
- The system may give other information
- GPS allows user to zoom in

* Geographic Information Systems (GIS) use satellites.

- Allows the user to model and analyse data according to location
- Allows users to create interactive queries
- Spatial awareness/see how images fit together in space
- Edit map data
- Combines maps, graphics and databases
- Layers a map with other data
- Works with GPS

Q1: 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.

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

Disadvantages

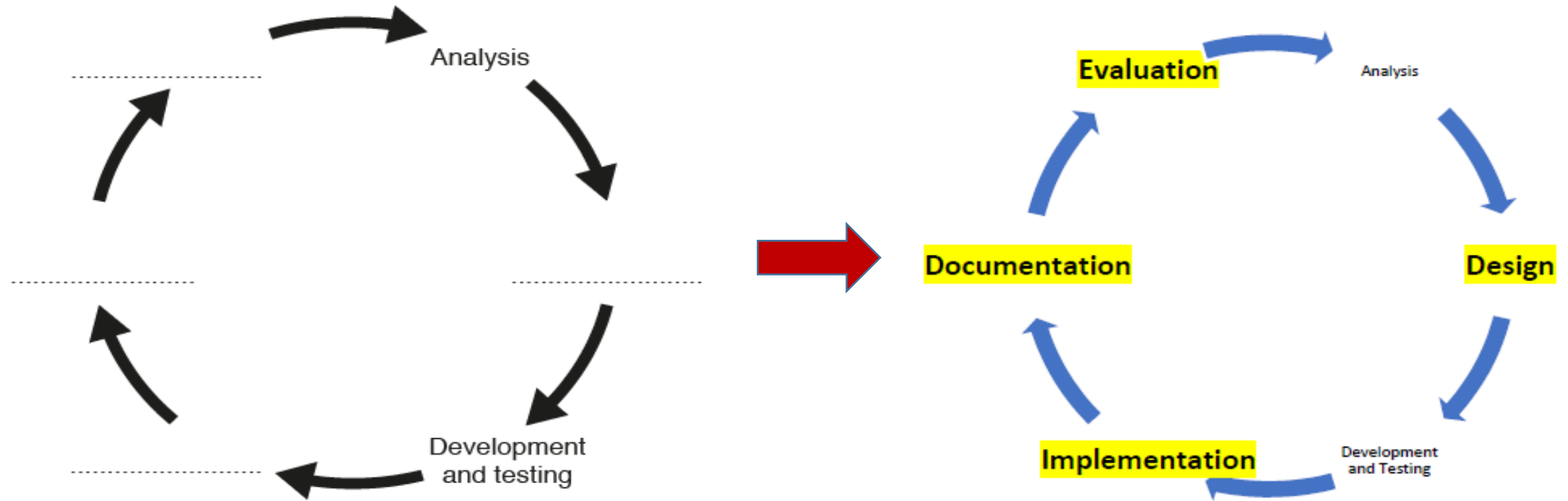
- If the system fails there is no backup but in parallel running if the system
- fails then the old system is still operational//risk of loss of data
- Staff have to be trained on the new system as it is implemented with parallel
- it is possible to train staff gradually.

Q1: 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.

Method chosen: Direct Changeover:

- 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

Q2: The systems life cycle is shown. The Design, Evaluation, Documentation and Implementation stages are missing.



* 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.	✓

(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.

- This is data that has been used with the current system / data not created for test purposes
- Therefore the results are known

(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.

- program listing
- program language
- program flowcharts/algorithms
- system flowcharts
- file structures
- list of variables
- test runs
- validation routines

* A large organisation is introducing a new computer system.

Compare and contrast pilot implementation with phased implementation of the new system.

- Neither introduce the system as a whole new system (across the company) / both introduce system in parts
- Both allow for the performance of the new system to be thoroughly assessed / tested
- Both allow gradual training
- Both take time to introduce the whole of the new system (to the whole company)
- Only one distinct part is being used so safer to implement
- Max four from:

Pilot implementation

- Whole system is implemented in one branch / one office at a time
- If the new system fails only one branch is affected
- Implemented in a company which has many branches all doing the same work

Phased implementation

- New system is implemented part by part
- Only one part is being implemented but could affect other departments

* You have created a spreadsheet to help your teacher to show progress in a series of tests.

• **(a)** Write a formula to be placed in cell C2 to produce the following:

• “Making progress” if the mark is 75 or more

• “Satisfactory” if the mark is 50 to 74 marks

• “Needs improvement” if the mark is 0 to 49 marks

	A	B	C	D
1	Student	Test mark	Progress	
2	A	10		
3				
4				

• =IF(B2>=75,"Making progress", IF(B2>=50,"Satisfactory",IF(B2>=0,"Needs improvement")))

OR

• =IF(B2>=75,"Making progress", IF(B2>=50,"Satisfactory","Needs improvement"))

OR

• =IF(B2<=49,"Needs improvement", IF(B2<=74,"Satisfactory","Making progress"))

(b) (i) Having created the formula, it needs to be tested to show that it displays the correct comment for each mark. Suggest an item of **test data** that would satisfy each of the following tests. Each item of test data must be different.

Test data	Expected output	Type of test
e.g. any number between 75 and 100	Making progress	Test using normal data
e.g. any number between 50 and 74	Satisfactory	Test using normal data
Either 0 or 49	Needs improvement	Test using extreme data
Either 50 or 74	Satisfactory	Test using extreme data

(ii) Explain why testing is important.

- To prove the system works as designed
- So that the system can be implemented correctly/modify the system if errors show up
- Trapping all errors
- Meets the user's expectations/requirements

(c) You are now asked to enter the marks for an additional 19 students into the spreadsheet and to produce a bar chart showing the student names and their test marks. Describe how you would create the bar chart.

- Select cells A1 to B21
- Insert chart/click on the chart icon
- Select bar chart
- Add/edit titles/label the axes/legend