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INFORMATION AND COMMUNICATION TECHNOLOGY

0417/11

Paper 1 Theory

October/November 2022

2 hours

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

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

INFORMATION

- The total mark for this paper is 100.
- The number of marks for each question or part question is shown in brackets [].
- No marks will be awarded for using brand names of software packages or hardware.

This document has **16** pages. Any blank pages are indicated.

- 1 Complete the following sentences using the most appropriate words from the list.

centre	double line space	footer	gutter	hanging
header	indented	justified	left	wrapping

- (a) A margin between the main content of the page and the fold of a book is called a

..... gutter [1]

- (b) An area at the top of a page is called a

..... header [1]

- (c) Feature of word processing that causes text to flow around an image is called

..... Wrapping [1]

- (d) When text is aligned along both the left and right margins this is called

..... Justified [1]

- 2 Smartphones and smartwatches can be used in everyday life. A smartwatch is a wearable computer in the form of a wrist-watch.

- (a) Apart from accessing the internet, give **three** other uses of a smartphone.

1 One can use them to take pictures using its
inbuilt camera.

2 By making or receiving phone calls.

3 Sharing of files via bluetooth
- Using calendar to book appointments.

[3]

(b) Give **two** advantages of using a smartwatch rather than a smartphone.

- 1 They are more portable as they are wearable on the wrist.
- 2 One can access simple apps easier e.g heart rate - less chance of it being dropped as it is fastened to the wrist.

[2]

(c) Give **two** disadvantages of using a smartwatch rather than a smartphone.

- 1 They have a smaller screen size and therefore might challenge one using it.
- 2 They have limited storage space hence more difficult to access detailed apps.

[2]

3 According to research carried out on passwords the top three most used passwords are 12345, qwerty and sunshine.

Describe, using other examples, the difference between a weak password and a strong password.

- Weak passwords are very easy to guess as they contain things that are associated by the person, a pattern, while strong passwords have a combination of both lower and uppercase, numbers and special characters.
- Weak passwords have low number of characters and they are of the same type like numbers, or characters alone.
- The examples above are all weak passwords but a strong password might be P@ssword!#

[4]

4 A teacher is setting up a database which she will use to record her student's exam marks.

(a) The teacher is planning to test the mark range using different types of test data. The range of marks that the teacher can award is 0 to 100.

(i) Write down **one** example of extreme test data that the teacher can use to check the range.

On the edge .
0 or 100 [1]

(ii) Extreme test data is one type of test data. The teacher uses two other pieces of test data.

Write down the type of test data for each of the examples.

TEN *Abnormal - The use of words instead of numbers.*
 55 *Normal - its within the acceptable range.*
 [2]

(b) Part of the database is shown.

Student_name	Date_of_birth	Gender	Exam_mark	Average_mark
Seth	25/02/2007	M	22	43.4
Adom	17/07/2007	M	67	73.1
Maria	02/05/2007	F	78	67.9
Lesedi	15/12/2006	F	45	50.0

Write down the field name which is the most appropriate for the data type, based on the data shown in the table. Your answers must be different in each case.

Boolean *Gender*
 Numeric: integer *Exam_mark*
 Numeric: decimal *Average_Mark*
 Alphanumeric *Student_name*

[4]

5 A student is carrying out a scientific experiment to measure the temperature of a liquid as it cools down. The student uses a sensor connected to a computer to read the temperature.

(a) Give **three** advantages of using computers and sensors rather than the student taking the temperature readings herself.

- 1 Taking of the measurements is a continuous activity and hence appropriate to use the sensors.
- 2 It is safer to use sensor than having the student do it themselves.
- 3 The computer reads the data more accurately.

[3]

(b) Describe how the readings taken by the sensor are displayed on a graph using the computer.

- Data is read by the sensor and is normally in analogue form.
- The data is converted to digital form by the use of an Analogue to Digital Converter (ADC).
- The digital data is passed to the microprocessor of the computer.
- The appropriate software is opened on the computer.
- The graph type is loaded and the read data is now uploaded into the graph.
- The graph is created using the data collected.
- All the axes and the legend are labelled properly.
- The process is continuous.

[6]

(c) Explain the differences between measurement systems and control systems.

With measurement systems, they are used to automatically detect changes in the environment; take the readings and store the result. They mainly read the physical properties like temperature. On the hand, with control systems, they compare the data read by sensors, with stored data and send out signals to alter process parameters depending on the comparison done to preset value.

[4]

- 6 There have been major issues regarding the accuracy of facial recognition systems for identifying suspects by the police.

Tawara Airport has installed biometric security including facial recognition systems to help the police recognise known criminals entering and leaving the country. Previously video was taken of all passengers and then checked manually.

- (a) Discuss the effectiveness of using facial recognition systems rather than the manual video system to increase security in this way.

Argument for;

- There's higher level of accuracy because face can be identified by electronic comparison.
- Face recognition systems can instantly identify individuals unlike with manual check by human being.
- The process of face detection is faster than with the manual process.
- By using face recognition, the system can work 24/7 without taking any rest which is not the case with human beings.

Argument Against;

- The process of setting up a face recognition system is very complex and hard and hence a tedious process.
- Persons wearing glasses or masks may affect the operation and recognition of people's faces.
- The use of biometrics take a lot of memory space hence will require a bigger hard-disk which is expensive. [8]

- (b) Give three examples of biometric data.

- 1 Finger print
 - 2 Retina
 - 3 Iris
- Voice

[3]

- 7 Instant messaging involves users sending text messages to each other.

Evaluate how you would use eSafety strategies in your own use of instant messaging.

e-Safety - involves electronic safety: how to protect yourself while interacting with others online.

- Avoid giving out your personal information especially to people not familiar to you.
- Always avoid use of vulgar or inappropriate language
- Make sure you are chatting with the right person by always confirming the address and their name.
- Avoid enabling location as it will give predators an idea of your whereabouts.
- Avoid meeting physically with strange people; and if there's a need to meet, always be accompanied by an adult and meet in public places.

[6]

- 8 Discuss the moral implications which need to be considered when creating an ICT solution.

This involves the things related to the society that may affect people's perception towards a given software. It could be words, images, quote, etc.

An ICT solution can cause distress to others in the society.

One needs to be considerate of images used and also the content; avoid inappropriate/obscene content.

Avoid creating an ICT solution that coerces people to give money.

Don't create a website full of false facts.

[4]

- 9 Use of smartphones to access the internet has increased by over 200% in the past five years.

Compare the use of smartphones to access the internet with the use of desktop computers to access the internet. Your answer must include similarities and differences.

Similarities

- They both can use wi-fi to access the Internet.
- They can both access Internet by use of hotspot

Differences

- With a smartphone, they are more portable and hence one can access Internet in more location than desktops which are not portable and can only be used in one place.
- One can connect a desktop computer by use of an ethernet cable which is not the case with smartphones.
- More websites and apps can run on a desktop unlike with a smartphone which has a smaller screen size, limited storage space and no keyboard only touchscreen [6]
- A Smartphone can use mobile data and can access both 4G/5G internet connectivity which is not possible with desktops.

- 10 A group of students in a school are planning to publicise a school concert. They can either produce a web page which will be sent to the company that runs the school website or create a multimedia presentation and show this to students and visitors.

(a) Give **two** types of content which could be used in a multimedia presentation that cannot be used in a printed leaflet.

- 1 Moving image
- 2 Animation
Audio output.

[2]

(b) Describe the advantages and disadvantages of using a multimedia presentation rather than a web page on the school website.

Advantages

- It's more interactive and hence easier to display to parents.
- Using multimedia will reduce the wordings and therefore it takes less time to display the information on a webpage to the parents.
- It's quicker to edit or update content of the multimedia presentation.
- They can even be viewed without internet access.

Disadvantages

- Producing a multimedia presentation require expensive software and people with specialised skills hence expensive.
- The presentation is only available in the school whereas with a web page; it can be accessed anywhere as long as one has access to internet.
- The multimedia can only be seen by students and visitors hence limited audience whereas with a web page it's available to anyone who has internet access.

[6]

The students need to test their multimedia presentation before it can be used.

(c) Name **two** output devices they can use and for each one, write down a reason for its use.

Output device 1 Monitor

Reason Used to display the presentation

Output device 2 Speaker

Reason For audio output. One listens to see if the sound matches the images being displayed.

[4]

- 11 A receptionist in a medical centre is going to send out emails to patients about medical results. The receptionist will use the data from patients' medical and personal records and mail merge these. One of the disadvantages of this system is that the receptionist will have access to personal data.

(a) Describe four other disadvantages of using mail merge.

- 1 One can pick a wrong data source and therefore emails sent to wrong addresses which could be very embarrassing.
- 2 If the email is not checked properly and the data source not kept up to date, then the letters could be full of errors.
- 3 It's difficult to correct sent mails because they involve many recipients.
- 4 The emails may be directed to junk mail folders because they appear to be very many recipients.

[4]

Due to data protection laws, personal data should be kept confidential and secure.

(b) Explain why personal data should be kept confidential and secure.

- This is because the data will have the name and other personal data that belongs to an individual.
- The data is very sensitive
- The data might comprise financial data, or bank statements which might lead to fraud.
- To prevent cyber-bullying incidences.
- To prevent identity theft using contact details
- To prevent hefty fines imposed on responsible people if the data was made public.
- The doctor's surgery reputation would suffer if patient records went viral.

[6]

12 Many students prefer to store data on external storage devices like pen drives or portable hard disk drives.

Describe **four** advantages of using a pen drive rather than a portable hard disk drive.

- 1 They are light weight and hence more portable as they can easily be carried.
- 2 They use less power as they have no moving parts.
- 3 They have a faster data access and hence more preferred than HDD.
- 4 While transferring data, they have a faster data transfer than with HDD.

[4]

13 Hyperlinks, bookmarks and anchors are software tools used in web pages and web browsers.

(a) Describe the function of a hyperlink.

They enable one to create a link into another web-page from the current page. It helps in improving navigation and access of resources within the webpage.

[2]

(b) Describe the term bookmark.

This is an easier method of saving a web-page address. They are used for easy retrieval of the webpage.

[2]

(c) Describe the function of an anchor.

An anchor is a specific location within a web page where when clicked it can move the pointer to either the start or end of the page. They are used on very long pages to help one avoid a lot of scrolling.

[2]

- 14 A research student is undertaking a study of endangered animals in the Amazon rainforest. She is using a drone to replace surveys carried out on foot. A drone is a remote-controlled flying vehicle.

Describe the benefits and drawbacks of using a drone to monitor the animals in the rainforest.

Benefits

- It's safer to use drones than human beings where they might be risking their lives.
- The drone can gain a better overall view of the forest than a human being can.
- Data from the drone can be used automatically by the computer system unlike manually collected data which must be prepared to be used by computer. → Digitisation
- Drones can capture data on given objects ~~area~~ without failure.

Disadvantages

- The noise from the drone might affect the animals and also scare them.
- Drones might find it difficult to navigate it through in the tree areas.
- If the drone crashes then it could be difficult to locate its whereabouts.

[6]