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INFORMATION AND COMMUNICATION TECHNOLOGY**0417/11**

Paper 1 Theory

October/November 2021**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 A computer consists of both hardware and software.

(a) Define the term hardware.

These are the physical components of a computer system. You can touch and see them. [1]

(b) Give **two** examples of internal hardware devices.

1 Processor

2 Graphics Card [2]

(c) Define the term software.

These are set of instructions that guide a computer on what to do. [1]

(d) There are two types of software: system and applications.

Give **two** examples of applications software.

1 Microsoft word

Spreadsheet

2 Microsoft Access

Microsoft powerpoint [2]

2 Circle **two** jobs where there has been a decrease in employment as a direct result of the introduction of computers.

Bus drivers

Car production workers

Delivery drivers for retail stores

Fishermen

Payroll workers

Programmers

Teachers

Website designers [2]

3 Describe **two** advantages of using a tablet computer rather than a laptop computer.

- 1 They are more lightweight hence more portable and can be used on the move than laptops.
- 2 They have lower power consumption and hence their batteries lasts for longer.

[2]

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]

- 5 Tawara Tours has created a new online booking system to allow customers to book holidays. The system was written using modules.

based on modularity

- (a) Describe how the new system could be tested prior to it becoming operational.

- Module - It is a software component that contains one or more routines. Performs a specific function.
- Each module is first tested independently to ascertain that it's error free.
 - The modules are tested by programmers using live data input to see how final output will look like.
 - User testing is done; by use of live data, the system is tested by those users who will use the system.
 - All suggestions by users and bugs realised are corrected and thereafter the modules are re-tested again.
 - Individual modules are integrated together and an integration test is done on the modules to ensure that the entire system is working well. [6]
 - Finally the entire system is tested as a whole to ensure that the user's requirements are all met.

- (b) Tawara Tours used to book holidays using a manual booking system. This used a pen and paper to make the bookings.

Discuss the advantages and disadvantages of using online booking systems rather than a manual booking system.

Advantages of online booking:

- One is not limited to official working hours hence booking can be done at any time of day or night.
- It saves one time and travelling cost as one does the booking at the convenience of their device.
- The customer can be able to see if booking has been effected immediately or not. It's real-time.
- Online booking is usually cheaper than booking physically as it helps to eliminate overhead costs.

Disadvantages

- One needs to be computer literate in order to be able to do the bookings alone.
- There's need for Internet connectivity for the process to work and in order to be able to access the system.
- Case of wrong bookings, it's difficult to correct the mistake and sometimes require one to visit the office physically.
- Setting up and managing the entire system is very expensive. In addition the Internet charges are also high.

- 6 As a student you often use a computer screen. This could be a screen on a desktop computer, a laptop computer or even a smartphone.

Evaluate your use of computer screens, in terms of health risks, and explain any strategies you use to minimise these health risks.

Let Personalise your answers.

Explain some of the problems associated with long use of screens:

- Eye strain
- Fatigue and headache.
- Having back and neck problems

Strategies to minimise these risks:

- Ensure that you have adjusted the height of screen properly so that it is at the eye level.
- Use an anti-glare screen or adjust screen brightness properly so as to avoid eye strain over.
- Take regular breaks at intervals of one hour so as to avoid sitting down for long hours.
- Ensure that the computer room is well lit and also using an LED / LCD screens. [6]

- 7 Bluetooth is a method of communication to connect devices together.

Describe how Bluetooth works.

Describe how a smartphone can use Bluetooth to connect to another device.

Bluetooth - a wireless transmission mode where data is transmitted among devices within a limited geographical area. (In our case we will use a smartphone) The smartphone sends data to its Bluetooth connector, where data will be converted to radio waves for ease of transmission. The smartphone automatically detects nearby devices and pairs with the device within the range that accepts connectivity. If fully paired, then the device accepts to send data. [4]

8 An organisation uses the internet and an intranet.

(a) Explain how the purpose of the internet differs from the purpose of an intranet.

Internet - global interconnection of computers worldwide
Intranet - internal network within an organisation.

- The Internet is used to share and distribute information outside the organisation whereas the intranet is within an organisation.
- The Internet is used to send and receive emails and messages outside the organisation whereas intranet sends and receives messages within an organisation.
- Internet allows one to browse through the www (web) [4]
whereas intranet is for internal communication.

Employees in the organisation are allowed to access the intranet using their smartphones.

The employees are required to secure their smartphones using either facial recognition, passwords or voice recognition.

(b) Tick (✓) whether the following statements refer to **facial recognition**, **password** or **voice recognition**.

	Facial recognition (✓)	Password (✓)	Voice recognition (✓)
This method cannot access the smartphone unintentionally		✓	
The accuracy of this method can be affected by noise			✓
This method requires the use of the smartphone's camera	✓		
This method could be compromised by shoulder surfing		✓	

[4]

9 Robots are used to spray paint cars in a car production company.

(a) Describe **two** other jobs that robots can perform in car production.

- They are used to do wheel balancing.
- fitting of windscreens.
- moving of cars from one place to another.

[2]

(b) When the spray paint can is empty it needs to be refilled. There is a sensor in the can which measures the amount of paint.

Describe the use of the sensor and microprocessor in this application.

- The sensor is an input device that is used to automatically read analogue data. In this case, the sensor will be used to read the depth of the paint in the can. This data is passed from sensor to Analogue Digital Converter (ADC) for digitisation. The digital data from ADC is then read by the microprocessor. Then the microprocessor compares this data to the minimum preset depth value. (is it above or below) If the data value for depth is above the preset value, then it does nothing but if the data value is less than the pre-set value then the microprocessor sends a signal to the actuator for refill to take place. This process is continuous.

[6]

- (c) Discuss the advantages and disadvantages of the introduction of robots rather than employing humans to spray paint the cars.

Advantages:

- Robots are cheaper in the long run rather than employees whom one has to pay them even benefits.
- They can work 24/7 without getting tired.
- They can work in hazardous areas where human life would be feared.
- They end up giving consistent results.

Disadvantages:

- They are very expensive to set up and maintain.
- They need constant update of the program just in case of new requirements.
- Employees need to be trained on how to operate robots, which takes time. [6]

- 10 (a) Explain the differences between a VLOOKUP function and a LOOKUP function.

VLOOKUP is used to do vertical searching whereas with a LOOKUP function, it works for both horizontal and vertical searching.

With a VLOOKUP, the user can select either an approximate or exact match to the lookup value which is not the case with LOOKUP. LOOKUP works when data is sorted. [3]

(b) A spreadsheet contains a list of staff and the rooms they work in at a school.

	A	B	C	D	E
1	Room	Department	Name		
2	29	Languages	Aaron Garcia	31	=VLOOKUP(D2,A2:C7,3)
3	30	History	Julieta Diaz		
4	28	Chemistry	Ernesto Fernandez		
5	26	Biology	Salvador Calbo		
6	31	ICT	David James		
7	49	Mathematics	Adriene Martinez		

(i) Explain, in detail, what the formula in cell E2 does.

VLOOKUP - A function in spreadsheet that is used to search for specific value; for this case it is D2, in the range A2 TO C7 and return a corresponding of the matched field i.e column 3. For the example above, it will return "David James."

[3]

(ii) When certain room numbers are typed into cell D2 unexpected results appear in cell E2.

Suggest improvements that could be made to ensure the correct result is displayed.

The user needs to add a '0' or FALSE at the end of the formula. In addition, the user can sort them into ascending order of column 4.
eg. E2 = VLOOKUP(D2,\$A\$2:\$C\$7,3,0)

[2]

A teacher in the school has created a spreadsheet to display whether a student has good timekeeping when arriving at lessons. He has produced a formula but thinks it could be improved. The formula is:

=IF(B4>=A\$18,B\$18,IF(B4>=A\$17,B\$17,IF(B4>=A\$16,B\$16,IF(B4>=A\$15,B\$15,IF(B4>=A\$14,B\$14,"")))))

	A	B	C
1			
2	Name of Student		
3	Half term	Lates	
4	1	17	=IF(B4>=A\$18,B\$18,IF(B4>=A\$17,B\$17,IF(B4>=A\$16,B\$16,IF(B4>=A\$15,B\$15,IF(B4>=A\$14,B\$14,"")))))
5	2	20	
6	3	1	
7	4	12	
8	5	18	
9	6	0	
10			
11			
12			
13			
14	0	Excellent	
15	1	Very Good	
16	5	Good	
17	15	Poor	
18	25	Very Poor	

(c) Write down the value that should appear in cell C4.

Poor

[1]

(d) The teacher has improved the formula and has typed in =VLOOKUP(B4,A\$14:B\$18,2)

Explain the advantages of using this formula compared to the original one.

- There's less typing and hence chance of making a mistake are very minimal.
- It is quicker to type in the formula.
- It takes up less storage space as less characters are used.
- While debugging, it is easier to locate errors within the formula than the other one.
- If one wants to add up more data within the range, then it's easier to do so than retyping it again the whole formula.

[4]

- 11 Many young people play online games. One problem with online gaming is that it is easy to give out personal details accidentally. Some users create weak passwords which could lead to their personal details being accessed.

(a) Name **two** pieces of personal data that could be accessed.

- 1 Date of Birth
Full name
- 2 Physical address
Gender.

[2]

(b) Write down **three** rules that should be applied when setting a strong password.

- One should avoid using passwords related to their personal data e.g. using their name or passwords or phone number.
- One should use a strong and complex password e.g. use of both small and capital letters, special characters.
- One should avoid using predictable words or patterns like 123456.
- Avoid using previous passwords.

[3]

(c) Describe safety measures that should be taken by gamers to ensure their data is safe other than using strong passwords.

- Always have a firewall that restricts all unauthorized attempts into the network.
- Play only with authorized versions of games which you have purchased from the right source and licensed area too.
- Avoid using or sharing your personal details to other gamers. Choose/use a username that is unrelated to your real name.
- Always log out from the gaming site once you are done playing the game.
- Use an anti-virus and anti-spying software to prevent virus attacks and key-logging threats.
- Use updated software in your computer.

[6]

12 The use of social networking is a part of modern living.

(a) Define the term social networking.

These are dedicated websites that help people interact and share files online. They are also used to bring together people with a common interest.

[2]

(b) Describe the benefits of using social networking.

- It promotes good communication among friends and colleagues all over the world.
- It allows real-time exchange of documents/files.
- It helps promote a person's talent or products. i.e. can be used as a platform for advertisement.
- One can get up-to-date information and the happenings around eg traffic updates.
- They can be used to bring professionals together and in case of a challenge, one can seek help quickly.
- They allow people to socialise and hence release boredom and promote social skills to shy people.
- Helps one to solicit for funds through online campaigns in case of help for sick people, a marathon etc.

[6]

- 13 A student is working on a project on the World Games. He has produced some information but has decided to produce a second layout including a table. The original layout and the new layout are shown.

2021 World Games

This will be the 11th World Games, a major international multi-sport event, for sports, or disciplines within a sport, that were not contested in the Olympic Games.

Dates: Thu, 15 Jul 2021 – Sun, 25 Jul 2021

Location: Legion Field, Birmingham, Alabama, United States

Host city: Birmingham, Alabama, United States

Opening ceremony: July 15

Closing ceremony: July 25

Main venue: The New Birmingham Stadium

The original layout

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Try it practically using MS Word.

The new layout

- (a) Explain, step by step, how the table was created, without the text being entered by hand.

- Open the application (MS Word) and load the document.
- Highlight the said paragraph that you want to convert to a table.
- Click on Insert; then Table; Select 'Convert text to Table...'
- Type in the number of Column (2), leave default behavior to default, then click 'Separate text at' select other and type ":" [4]
Then click OK.

- (b) The student checks the text he has written using a spell checker.

Explain how a spell checker works.

The spell checker normally compares each typed word with what is in its database and then uses its defined algorithm (set of rules or program or mathematical function in the program) to check the spelling based on the database/dictionary used. [2]

- (c) Explain why the suggestions made by the spell checker do **not** always give the correct response.

It is because it only checks for spelling and not grammatical sentence construction.

Real names / Some names are not recognised by the system.
Some words may be misspelt but end up forming another word hence will not recognise that. [2]