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INFORMATION AND COMMUNICATION TECHNOLOGY

0417/11

Paper 1 Theory

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1 hour 30 minutes

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 80.
- 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.

- Chapter 1: Types and Components of Computer Systems

- 1 Circle **two** internal hardware components.

X
Actuator

X
Cloud

X
DVD

X
HDD

Motherboard

X
Printer

ROM

X
SD Card

[2]

- 2 Complete each of the following sentences.

- Chapter 8: Safety and Security

- (a) The scrambling of data being sent from one device to another device is called

Encryption

[1]

- (b) Using a computer to maintain the temperature of a room is called

Control

- Chapter 1: Types and Component ...

[1]

- (c) Unauthorised access to a computer system is called

Hacking - Chapter 8: Safety and Security

[1]

- (d) A conversation between a systems analyst and a member of staff that is part of the analysis is called

Interview - Chapter 7: The Systems life Cycle

[1]

- 3 Roger is a 16-year-old student who is setting up a password for his computer. He has four ideas for the passwords he may use.

Chapter 8: Safety and Security

- (a) Select the most appropriate password from the list and give reasons for your choice.

Roger2008

R08123

RogerZpa55w0rd

6lRrg08&

Password 6lRrg08&

Reasons Strong password

..... Hard to guess

Others Not directly related to personal details

.....

[3]

Chapter 8: Safety and Security

- (b) State **one** way of avoiding password interception.

..... Changing password regularly

Other - Be aware of shoulder surfing

[1]

Chapter 8: Safety and Security - E-safety

- 4 There are risks involved when using social networking sites.

Describe **four** strategies you could use to minimise the risks of using social networking sites to make new friends.

- 1 Block and report unwanted users
- 2 Do not meet an online contact face to face, Always tell an adult if you plan to meet in person and should be in a public place
- 3 Always maintain privacy settings and control who can access your profile
- 4 Always respect Confidentiality of new friends

[4]

Chapter 1: Types and Components of the Computer Systems

- 5 One benefit of using a command line interface (CLI) is that it uses less computer memory. - User Interface

(a) State **two** other benefits of a command line interface (CLI).

- 1 The user is in direct communication with the computer
- 2 Users are restricted to a number of pre-determined options

[2]

(b) State **two** other types of user interface.

- 1 Graphical User Interface
- 2 Dialogue-based user interface

[2]

Chapter 4: Networks and the effects of using them

- 6 Many organisations use audio-conferencing or video-conferencing as some employees work from home.

Discuss the advantages and disadvantages of using audio-conferencing rather than video-conferencing.

Advantages

- Can do other tasks as there is no camera
- No issues with Lip Sync
- Less equipment is required which makes it cheaper
- Simpler interface for employees

Disadvantages

- Cannot see the body language of the employee in the Conference
- Cannot tell if the employees are paying attention
- Others - Harder to control the meeting as you do not know who is speaking next
- fewer features than audio-conferencing

[6]

- 7 An organisation has provided laptops for its sales team to use when working at home and in the office.

(a) Give **two** benefits to the employees of using these laptops for their work.

Benefit 1 Does not require the use of external storage devices
When transferring data to and from the office

Benefit 2 Employee does not have to use his or her own equipment
Which saves money for the employee.

Others Benefit 3 would only be used by the employee therefore improves security [2]

(b) Give **two** issues that may arise from providing employees with these laptops.

Issue 1 Laptop can be stolen / lost

Issue 2 Device could be used for other personal activities

[2]

Chapter 7: The Systems Life Cycle - Data Capture format

- (c) The network manager of the organisation has been asked to record the details of the employees who have been provided with laptops. The network manager has decided to produce an online data capture form.

Describe the main design features that should be considered to make the online data capture form easy to complete accurately.

- Navigation buttons to move to the next page
- On screen help button to get help with filling in the form
- Dropdown boxes where there limited choices
- Use of radio button for gender

Others

- Font size to make it easier to read
- Font style to make it easier to read
- Good use of the white spaces

[4]

Chapter 6: The effects of using IT

- (d) The employees are given a list of strategies to follow to reduce the health risks of using laptops.

State **four** strategies that could be included in the list.

- 1 Use a wrist rest
- 2 Use an ergonomic chair / mouse / keyboard
- 3 Maintain Correct posture
- 4 Ensure the room lighting matches the screen brightness

[4]

8 Virtual reality can be used when training for sports.

(a) State **two** other uses of virtual reality.

— chapter 1: Types and Components of Computer Systems → Extended reality

1 Entertainment (Gaming)

2 Military application (training to operate a new tank)

[2]

(b) Discuss the impact of virtual reality on everyday life.

- Allows training in dangerous situations where it is impossible to practice the real thing
- Allows people to retain knowledge much better than reading about it in a book
- People can be trained in a virtual environment without risk to themselves
- Designs can be modified quickly therefore better objects can be made
- Can become addicted to gaming with this system
- Causes headache, motion sickness, falling over

[6]

- 9 An expert system can be used to diagnose problems.

— Chapter 6: ICT Applications

Explain the following components of an expert system.

(a) Rules base

- Set of Inference rules
- Used by the Inference engine to draw Conclusions
- Rules logical thinking which involves a series of IF statements

[3]

(b) Inference engine

- Main processing element of the expert systems
- acts like a search engine examining the knowledge base for information that matches the queries
- It is the problem solving part of the expert system

[3]

Chapter 5: The effects of using IT

- 10 An autonomous vehicle uses an automated braking system. There is a sensor at the front of the vehicle to measure the distance between the vehicle and the obstacle. The brakes are applied when the vehicle gets too close to the obstacle.

Sensor → ADC → Microprocessor → DAC → Actuator

Describe the use of a microprocessor in the automated braking system.

- The microprocessor receives the data
- A preset value of the distance is stored in the microprocessor
- The microprocessor compares the data to the preset value
- If the data is less than the preset value the microprocessor send a signal to the actuator applies the brakes
- If the data is more than the preset value the microprocessor does nothing
- Process is continuous

[4]

Chapter 7: The systems life cycle - Implementation

- 11 A company is designing a new computer system. After the system has been created and tested, it will be implemented.

- (a) Compare parallel running and direct changeover. Your answer should include both similarities and differences.

Similarities

- Both methods of Implementation
- Both involve changing of the whole of the old system to a new system

Differences

- With Parallel running both systems operate together until the old is removed while with direct changeover the new system is implemented immediately

[4]

- With Parallel running the changeover is safer as the old system is still operating for a while with direct changeover cost are reduced as only one set of staff needs to be employed

Chapter 7: The Systems Life Cycle - Evaluation

- (b) There is new software in this computer system that has to be evaluated.

Describe what needs to be considered when evaluating new software.

- Compare the final solution with the original tasks
- Identify any limitation of the system (software)
- Identify any necessary improvements that need to be made
- Compare performance of the new software with the performance of the old software

[4]

- 12 One of the threats to personal data is credit card cloning.

Chapter 8: Safety and Security

- (a) Explain what is meant by credit card cloning.

- Copying of credit card which uses magnetic stripe with an electronic device known as skimmer
- A type of credit card theft
- A digital copy of the credit card is made with data placed on a new blank card

[3]

Chapter 8: Safety and Security

- (b) One security improvement for this type of threat is the use of contactless cards.

Give **two** other security improvements that could be made to help reduce this type of threat.

1 Use of Personal Identification Number (PIN)

2 Inspect the credit card reader you are using

others

Use third party / smartphone electronic payment systems

[2]

Chapter 18: Proofing

- 13 A new patient is attending a medical centre. He completes a form with his details and gives this to the secretary who enters the details into a database.

- (a) The secretary carefully checks the details entered into the database with those on the form.

State what this process is called.

Visual Verification

[1]

Chapter 8: Safety and Security: E-Safety

- (b) The medical centre follows a data protection act, so the patient's data is protected by law.

State **four** principles of a typical data protection act.

1 Data must be accurate

2 Data must not be kept longer than necessary

3 Data must be kept Secured

4 Data must not be transferred to another Country unless they also have adequate protection

[4]

- (c) The age of the patient is stored on the patient's medical record.

- (i) Explain why it is **not** sensible to store the age of the patient in the database.

- The age of the patient changes every year

Others

- The data would need to be updated regularly

[1]

- (ii) Explain what change could be made to the database to solve this problem.

- use the fixed date of birth (DMY)

[1]

Chapter 7: The Systems Life Cycle

- (d) The database includes primary and foreign keys.

A medical ID number is used as the primary key in the database. Examples of the medical ID number include:

556 442 8483

450 557 7104

485 777 3456

- (i) State **two** validation checks that could be used to check the medical ID number.

1 Formal Check

2 Length Check

others 3. Type Check

[2]

Chapter 18: Databases

- (ii) Describe the characteristics of primary keys and foreign keys.

Primary Key

- is unique

- helps identify the record

others - Cannot be a null value

- Create relationships

Foreign Key

- Can have a null value

- a key in a table which is a primary key in another table

- enforce referential integrity

- found relational databases

[4]

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