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INFORMATION AND COMMUNICATION TECHNOLOGY

0417/12

Paper 1 Theory

October/November 2023

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 **12** pages.

- 1 Tick (✓) **one** external device.

Hardware is the physical component that makes up a typical computer

Types

1. Internal → system unit
2. External

- Chapter 1
- A sound card ☐
- B pen drive ☒
- C motherboard ☐
- D ROM ☐

[1]

- 2 A computer system uses both analogue and digital data.

(a) Explain what is meant by these types of data.

- (i) analogue data

— Continuous data

[1]

- (ii) digital data

— Discrete data

[1]

- (b) Digital data is processed in a computer system. Sometimes digital data needs to be converted to analogue data.

Explain why digital data may need to be converted to analogue data.

— So that it can be sent to an actuator

Others

— To control an external device

[1]

- (c) Use the most appropriate phrase from the list to complete the sentences. Your answer must be different in each case.

analogue data

digital data

display a graph on a monitor

input the maximum safe water level for a river

measure acidity levels in a river

control humidity levels

open the windows in a greenhouse

- (i) A motor is used to

Open the windows in a green house

[1]

- (ii) A DAC outputs

Analogue data

[1]

- (iii) A sensor is used to

measure acidity levels in a river

[1]

Chapter 4 - Networks and the effect of using them⁴

3 Identify **three** different network communication devices and describe what each one does.

Device 1 Hub

Description Connects nodes/computer so that data can be broadcast
to all devices

Device 2 Switch

Description Allows data packet to be sent to specific device only
- other - Connect computers together to form a LAN (Local Area Network)

Device 3 Bridge

Description Connects Multiple LAN to function as a single LAN
Other - It connects one LAN to another LAN using the same
protocol (communication rule)

[6]

- 4 A teacher is creating a database for a class library. The teacher types the details of each book into the database. The teacher has entered a number of records.

Book_number	Name_of_book	Publisher	Date_acquired	ISBN
1101	Build a computer	JB Books	02/11/2020	9780119192065
1012	IT terms	MMA Books	16/05/2021	0893603944
1414	Databases are fun	Cam Press	01/10/2009	0090116393

Chapter 7
SDLC - Design
Phase - Validation
routine

Identify and describe a validation check based on the data shown in the database table, which could be applied to the data as it is entered into each of the fields. Each validation check must be different.

Book_number

Validation check..... *Type / Character Check*

Description..... *Each data entered must be an integer*

.....

.....

Date_acquired

Validation check..... *Format Check*

Description..... *First two numbers followed by a slash then next two numbers followed by a slash (1) then four (4) numbers*
i.e DD/MM/YYYY

.....

ISBN

Validation check..... *Check digit*

Description..... *The number is checked by calculation of all the separate digit entered.*

.....

[6]

- 5 A group of pupils is planning to create a newsletter for a history project. The group can either use a smartphone or a phablet computer.

(a) Explain what is meant by a phablet computer.

Chapter 1 -
Types of
mobile computer

- A hybrid between tablet and smartphone
 - The device size is between a tablet and a smartphone
- Others
- The device that has the features of a smartphone and tablet [2]

(b) Discuss the advantages and disadvantages of using a phablet computer rather than a smartphone for this project.

Advantage

- A phablet has a larger screen size, so it's easier to type text
- Pupils can view the project at the same time due to the screen size
- The on-screen keyboard is larger making it easier to enter the data
- Better control over the layout of the screen

Disadvantages

- Less portable than a smartphone
- Pupils are more likely to have a smartphone with them

[6]

- 6 Many teachers use multimedia projectors in their lessons.

(a) State **two** health issues associated with the use of multimedia projectors.

Chapter 5
Health risk

- 1 Eye problems
- 2 Headaches

[2]

(b) State **two** safety issues associated with the use of multimedia projectors.

- 1 Tripping over trailing cables
- 2 Lubrication caused by spilling liquid on the projector.

[2]

Chapter 2

chapter 5

7 A video of a race can be recorded using a camera either on an autonomous flying vehicle (drone) or in a helicopter. A person would be needed in the helicopter to operate the camera.

Describe **two** advantages and **two** disadvantages of using an autonomous flying vehicle (drone) to record the video of the race.

Advantage 1 It is cheaper to use a drone rather than using a helicopter

Advantage 2 The drone could fly closer to the competitors than a helicopter

Disadvantage 1 It can fly out of range and lose control signal

Disadvantage 2 The drone may become a distraction as it is closer to the race

[4]

8 State the most appropriate storage medium from its description. Chapter 3 & Chapter 4

(a) A storage medium that stores data on the internet.

..... Cloud storage [1]

(b) Internal storage where the current instruction is stored.

..... Random Access Memory (RAM) - Chapter 1. [1]

(c) A solid-state storage that is used in digital cameras.

..... XD (Extreme Digital) card or Compact Flash (CF) card (memory card) [1]

(d) An optical storage medium that stores high-definition (HD) movies.

..... Blu-ray disc [1]

- 9 A hospital administrator enters data from medical forms into a database. Validation and verification are both used when entering data to minimise errors.

Explain what is meant by validation and verification and why they are both needed in this scenario.

Validation

- ensures the data entered are sensible
- Ensure the data entered satisfy certain criteria

Verification

- Check that the data entered is identical to the original document
- Ensures that the data is copied correctly

Both are needed because:

- Individually they cannot detect all errors
- if the data is incorrect, it could lead to consequences

Other

- Data entered should be free from error to ensure the patient are safe.

[6]

- 10 The manager of the Tawara Hotel has decided to computerise the hotel's room booking system. The new booking system will allow customers to book rooms online using an app on their smartphones.

The manager has employed a systems analyst who will carry out research into the current system by examining existing documentation and completed questionnaires from staff.

- (a) One item of information that the systems analyst will need to identify is problems with the current system.

State **three** other items of information that the systems analyst will need to identify.

- 1 Input, processing and output of the current system
- 2 Hardware and software requirement of the new system
- 3 User requirement for the new system

[3]

- (b) Following the analysis, the systems analyst will implement the new system using either parallel running or direct changeover.

Evaluate these different methods of implementation.

Parallel running

- staff can be trained gradually on the new system
- It is expensive to operate as there are two sets of staff operating the systems
- If the new system fails, the old system is still available

Direct Changeover

- The new system is thoroughly tested before use, therefore less chance of it being faulty
- Immediate benefit
- staff have to be trained before the new system is implemented, this can be difficult as they are still working

[6]

- (c) Describe the benefits and drawbacks of using an online booking system.

Benefits

- Easier to cancel / change booking
- Available 24/7 for customers to book when they want
- Faster booking system as there is no wait in queue
- Immediate Confirmation / rejection of the booking

Drawbacks

- Need an internet connection

Others

- Security issues due to fraud
- < wrong information may be added accidentally

[5]

Chapter 6
ICT application
- Booking system

- (d) The hotel uses both a WAN and a WLAN.

Describe the differences between a WAN and a WLAN.

WAN

- Wide Area Network
- Makes use of a Satellite technology

WLAN

- Wireless Local Area Network
- Wireless technology

[4]

- 11 A clothing retailer only sells its clothes on the internet.

- (a) Discuss the benefits and drawbacks to the clothing retailer of using internet shopping.

Benefits

- Saves cost as less staff are required
- Saves cost of renting a shop
- Larger customer base which can lead to increase profits
- The selling is not limited to shop opening hours

Drawbacks

- Reliant on technology
- Need a large warehouse space

Others

- Operate 24/7 which increases overheads
- Relies on customers that only shop online

[6]

Chapter 4
Networks

Chapter 6
ICT applications
Internet shopping

- (b) A customer is purchasing some new clothes from this retailer.

Describe the steps the customer would take when purchasing the new clothes using internet shopping.

- Load up the website
- Create an account
- Login to the website
- Browse through the online Catalogue
- Click on the items you want
- Enter the size of the items
- Add the item to cart
- Click on Checkout
- Add a payment method
- Check the details entered
- Logout of the system (optional)

[5]

- 12 The manager of a sports club is designing an online form for members to enter their personal details. The form must be accessible to all members of the club.

- (a) State **four** characteristics of a good form design.

1. Fill up the screen i.e. a good use of white space

2. Use of navigation buttons (drop down, radio button)

3. Font size is large enough to read

4. Appropriate size of data entry sections
Others

5. Easy data entry

6. Use of the help button

[4]

Chapter 7
SDLC - Design phase
Input/output
format

- (b) State **two** characteristics of good form design that would help users with visual impairment to enter their data.

Chapter 9
Audiences
Types of the
needs of the
audience

- font size is large enough to read

- Use of Voice entry

Others

- Use of Contrasting Colours

- Buttons are large enough to see

[2]

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