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INFORMATION AND COMMUNICATION TECHNOLOGY**0417/12**

Paper 1 Theory

May/June 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.

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- 1 Tick (✓) whether the following are examples of **control**, **measurement** or **modelling** applications.

	control (✓)	measurement (✓)	modelling (✓)
Personal finance			✓
Weather forecasting			✓
Burglar alarms	✓		
Weather stations		✓	

[4]

- 2 (a) Circle **two** items that could be used to output data directly from a smartphone.

Blu-ray disc

microphone

mouse

screen

SD card

sensor

speaker

webcam

[2]

- (b) One of the uses of a smartphone is the sending and receiving of emails.

Describe **four** other uses of a smartphone.

1. They can be used to browse through the internet to search for information.
2. One can use them to perform internet banking.
3. They can be used to make and receive phone calls.
4. One can use them to stream videos like youtube and other related sites.

[4]

- 3 Tick (✓) the most appropriate storage medium that should be used in each scenario.

Scenario	Magnetic tape (✓)	RAM (✓)	ROM (✓)
To store the current instructions in use by a computer		✓	
To back up data from a school network server	✓		
To store data temporarily		✓	
To store the start-up instructions of a computer			✓

[4]

- 4 Complete the sentences below using the most appropriate word from the list.

cookies
smishing

hacking
spam

pharming
spyware

phishing
virus

- (a) The act of gaining unauthorised access to a computer system is called

..... *Hacking* [1]

- (b) The software that gathers data by monitoring key presses on a user's keyboard is called

..... *Spyware* [1]

- (c) A fake text message, that could contain a link, sent to a mobile phone is called

..... *Smishing* [1]

- 5 Petr has set up a database for a science project on planets in the solar system. Part of the database is shown.

ID	Name_of_planet	Number_of_moons	Orbital_period	Rings	Gravity	Type_of_planet	First_observed
4	Mars	2	1.88	N	0.38	Regular	<u>1610</u>
5	Ceres	<u>0</u>	4.61	N	0.27	Dwarf	1801
7	Saturn	62	29	Y	1.16	Gas Giant	1610
9	Neptune	14	165	Y	1.21	Gas Giant	1846
10	Pluto	5	248	N	0.62	Dwarf	1930
11	Haumea	1	309	N	0.401	Dwarf	2004

- (a) When Petr was designing his database, he had to set the data types for each field. Complete the design table below by filling in the data types for each named field. Use the **most** appropriate data type. Each data type must be different. For any numeric field, specify the type of number.

Field name	Data type
Number_of_moons	Numerical : Integer
Orbital_period	Numerical : Decimal or Float
Rings	Boolean
Name_of_planet	Text / String

[4]

equal to
not equal to

- (b) Operators such as AND, OR, NOT, LIKE, >, >=, <, <=, =, <> can be used to search Petr's planet database. The search criteria for all the gas giant planets with more than 20 moons would look like this:

Type_of_planet = "Gas Giant" AND Number_of_moons > 20

Write down the search criteria that will produce a list of planets that are not gas giants but have at least one moon and were first observed after 1800.

Type_of_planet <> "Gas Giant" AND

Number_of_moons >= 1 AND

First_Observed > 1800

> Greater than

>= Greater than or equal to

[7]

- (c) Write down the names of the planets that are not gas giants but have at least one moon and were first observed after 1800.

Pluto

Haumea

[2]

- (d) Petr has copied the data from the Orbital_period field into a spreadsheet. The data for the orbital period for Mars, 1.88, is stored in cell A2. In cell B2 he has entered a function of:

ROUND(A2,0)

Explain in detail the function used in cell B2.

The ROUND function is used to round off a number in the defined cell based on the number of decimal places defined.

ROUND(A2,0)

defined cell

: It will round off cell A2 data into full integers (0 decimal places) [2]

- 6 Humans can send unmanned aircraft into storms to collect wind speeds and temperature data. The unmanned aircraft have sensors attached to them which send the data back to computers at the weather station. The computers analyse the data.

Previously the aircraft was manned and all the data was collected and flown back to the weather station.

Discuss the advantages and disadvantages of using the unmanned aircraft rather than using the manned aircraft.

Advantages of the Unmanned aircraft.

- It saves on cost of the aircraft with people to send back the weather station.
- Its less risky to human life as no human life is involved.
- The results are processed immediately as they are processed by the sensor and microprocessors.
- The readings can be taken more frequently than when having the manned aircraft being used.

Disadvantages

- A failure of the sensor means no data collected and repairing them is not easy unless a human intervention.
- Due to the electrical charges in the storm, they might cause a loss of signals hence no data collected.
- They are expensive to set up and manage.
- They might end up doing a lot of readings which will fill up the memory space early hence need to frequently upgrade to new storage devices. [8]

- 7 The owner of Tawara Hotels is planning a new computerised booking system. There are ten Tawara Hotels throughout the world. The current booking system allows people to book rooms in any of the Tawara Hotels. He has employed a systems analyst to research the current system and then install the new system.

- (a) When analysing the current booking system, the systems analyst must identify the user requirements.

Explain why it is important for the systems analyst to do this.

- This is because while developing a new system he should develop one that meets all the user's needs.
- The client knows better his system and his needs and therefore should be consulted all through.
- This is also to reduce chances of system being rejected by the client as it's not performing as expected.
- In order to develop a more efficient system that integrates well with all other hardware and software. [3]

- (b) Tick (✓) the relevant stage of the systems life cycle for each of the following activities.

Activity	Analysis (✓)	Development and testing (✓)	Evaluation (✓)
Identifying the problems with the current system	✓		
Comparing the solution with the original task requirements			✓
Create the file structure		✓	
Identify limitations to the new system and improvements to be made			✓

[4]

- (c) Before the new booking system is installed, the systems analyst has to decide on a method of implementation. One method of implementation is pilot running.

Name **two** other methods of implementation and describe **two** benefits of each.

Name Parallel Changeover - Both old and new running.

Benefit 1 In case the new system fails, there's a back up from the old system.

Benefit 2 The staff members and users can be able to compare results from both systems hence easier training.

Name Direct Changeover - From old to current system.

Benefit 1 It's the cheapest method as it's only one system running at any given instance.

Benefit 2 The client will get all the benefits of the new system earlier than any other changeover methods.

[6]

- 8 Students often use IT equipment; therefore it is important to have a good physical safety strategy.

Evaluate your own use of IT equipment, in terms of physical safety, and describe the strategies you will need to minimise the potential physical safety risks.

- i. Avoid having trailing cables. They should all be fastened to the wall in order to avoid tripping hazards.
- ii. No drinks or food brought near the computers. If its eating, it should take place in the dining area in order to avoid electrocution incidences.
- iii. No damaged wires or cables are used. This will help reduce chances of spoiling the computer or even getting electrocuted.
- iv. All IT equipments are well placed on strong tables or cabinets. This will help reduce the risks of them falling on users that may cause injury.

[6]

- 9 (a) Describe two uses of a company intranet. — internal network

1. They help in internal file transfer within the organisation.
2. They facilitate effective sharing of office applications / software and other resources like printers.

[2]

- (b) Social networking is used to communicate with friends; this is one use of the internet.

Describe **four** other uses of the internet.

- 1 Online conferences; video conferencing and web conferencing; like the use of zoom, teams.
- 2 Browsing of information that will help one do proper research.
- 3 Online entertainment via online music, videos, online gaming.
- 4 Application of jobs and file transfer.

[4]

- (c) A major part of the everyday use of the internet is social networking. Currently some social networks are not policed. The owners of a website have full discretion on what material is removed and what is allowed to be kept.

Discuss the benefits and drawbacks of policing social networking sites.

Benefits

- It will help in reducing chances of users involving themselves in illegal activities online.
- It helps in protecting the vulnerable against cyber-bullying, or even hate speech.
- It would help in preventing people from being subjected to inappropriate messages.
- It will help reduce the ability to incite violence.

Drawbacks:

- It would be a very tedious activity to police as there is a massive amount of information posted at every instance.
- It's very difficult to decide what is acceptable and what's not acceptable based on different codes of languages.
- There's loss of privacy as those policing end up reading one's messages.
- It's very costly to create a policing agent and cost associated with that are very high. [8]

- 10 Describe the advantages, to both the company and employees, of changing work patterns due to the introduction of computers.

Advantages to the Company:

- It would help an organisation to remain open for longer hours or even 24/7 by having Flexi-timings.
- Working from home would help reduce organisation running cost like reduce office space and electricity costs.
- Working from home allows the company to employ people from around the world.

Advantages to Employees:

- Compressed hours allow an employee to have more leave or holiday days hence more motivated.
- Stages are more flexible while working hence more contented.
- Working from home allows employees to balance their home life. [6]

- 11 When an email is sent, it could have a digital certificate attached.

Explain why a digital certificate is required. Include in your answer items that could be found in a digital certificate.

- Digital Certificate is one way of ensuring that email transmission is safe and reaches the right person.
- They are used to "beef up" security by verifying that the email comes from a known and trusted source.
- They are also used to initialise a secure socket layer connection between web browsers and web servers.

Items found in a digital certificate include:

- Details of the owner of the digital certificate.
- A serial number
- Its validity from --- To --- . [5]

12 A search engine can be used to find information on the internet.

- (a) Describe the disadvantages of using a search engine to find information rather than typing in a web address.

Disadvantages of using search engines.

- By use of search engine, the search engine company may be paid to display certain web pages which limits researcher.
- The search engines may not include all the web-pages hence limits the sources for research information.
- They might display or give irrelevant information.
- The website that loads faster is given priority which limits one from accessing heavy but relevant sites. [4]

- (b) A student is writing a project on rare animals. He uses a search engine to find information about the animals from the internet. He is concerned about the reliability of some of the information he has found.

Explain how he would evaluate the reliability of this information.

- He needs to check other people's reviews and if the website has been endorsed by reliable people.
- He needs to do a comparison to information available from reliable and authenticated experts/researchers.
- He needs to check if the website has excessive advertisement running and pop-up. If so he should avoid such a site.
- He needs to do a thorough check of the author of the website and if it's a reliable and trusted researcher.
- To check if the website is well designed, layout well organised and has minimal grammatical errors.
- To check if the author's credentials are good. [6]

The student plans to create a table, using word processing software, to display the information he has found out about the animal.

The completed table will look like this:

Name of animal	Tiger quoll
Scientific name	Dasyurus maculatus
Pouched	No
Habitat	Australia
Conservation status	Threatened

(c) Explain how the student can create a table to enter this data.

- He should place the cursor where he wants to put the table.
- Click on Insert, then select Table.
- Select the rows (5 rows) and 2 columns then OK.
- Type in the data as it appears above. [2]

(d) The student has saved a picture from the internet of a tiger quoll.

Explain how he could create a new row above the Pouched row and place the picture into the right-hand cell of this new row.

- Highlight the Pouched row, then right click on it, select insert row, new row above.
- Thereafter, he needs to click or place cursor on the right hand cell in the row, click on pictures, browse to access the location where the picture has been saved, select that picture, then click insert.
- Format the picture appropriately in terms of size and any other relevant formatting style. [4]