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இலங்கை பரீட்சைத் திணைக்களம் இலங்கை பரீட்சைத் திணைக்களம்
Department of Examinations, Sri Lanka Department of **இலங்கை** **பரீட்சைத்** **திணைக்களம்** ons, Sri Lanka De
ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
இலங்கை பரீட்சைத் திணைக்களம் இலங்கை பரீ **Department of Examinations, Sri Lanka** இலங்கை பரீட்சைத் திணைக்களம்

| 80 | E | I, II |

General Certificate of Education (Ord. Level) Examination, 2021 (2022)

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2021(2022)
கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தரப் பரீட்சை, 2021 (2022)

තොරතුරු හා සන්නිවේදන තාක්ෂණය	I, II
தகவல் தொடர்பாடல் தொழினுட்பவியல்	I, II
Information & Communication Technology	**I, II**

## Information & Communication Technology II

* Answer *five* (05) questions only, including the *first question* and *four* others.
* *First question carries* **20** *marks and each of the other questions carries* **10** *marks.*

1. (i) The teachers in a particular school are expected to mark their attendance using a fingerprint machine, which is connected to a computer system. The system generates a monthly attendance report.

   Write down **one** example for an input and **one** example for an output of the above information system.

   (ii) (a) Draw a diagram to connect four computers namely C_1, C_2, C_3 and C_4 based on the *mesh* topology.

   (b) Consider the following computer ports labelled Ⓐ – Ⓓ.
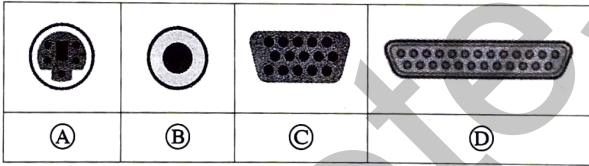
   Match each of the above ports with the name of the ports given in the following list in the **label** $\rightarrow$ **port** format.

   Ports : {Audio, HDMI, PS/2, Parallel, RJ45, Serial, USB, VGA}

   (iii) (a) Convert 47_{10} to its binary equivalent.

   (b) Following is an extract from the ASCII table. Write down the correct octal value replacement for the '?' symbol.

Character	Decimal	Hexadecimal	Binary	Octal
a	97	61	1100001	?

   (iv) (a) Draw the logic gate circuit for the following Boolean expression:
   $$F = \bar{C} + A\bar{B}$$

   (b) Write down the value of F when $A = 0$, $B = 1$ and $C = 1$.

   (v) There is a very important software that runs on a computer. It manages various resources of the computer. It also lets the users communicate with the computer. This particular software coordinates and fulfils the requirements of all processes with respect to their central processing unit (CPU), memory and storage needs.

   (a) What is the specific software referred to in the above paragraph?

   (b) Give **one** example for it.

(vi) The following table shows some of the icons labelled Ⓐ–Ⓓ of the Audacity audio editing software.

●	▶	⋙	■
Ⓐ	Ⓑ	Ⓒ	Ⓓ

Identify the suitable description for each of the icons Ⓐ–Ⓓ from the description list numbered ①–⑥. Write down each icon label and its corresponding description number in **label → number** format.

Description	Trim Audio	Record	Select	Stop	Skip to End	Play
Number	①	②	③	④	⑤	⑥

(vii) Match the descriptions labelled Ⓟ–Ⓢ with the correct terms from the list of terms given below and write down the relevant term against each label in the **label → term** format.

Label	Description
Ⓟ	Used for electronic mail exchange among mail servers on the Internet
Ⓠ	Provides access to the software installed in the cloud
Ⓡ	Folder to store mails that are composed to be sent, but not completed yet
Ⓢ	Used to uniquely identify a computer on the Internet

List of terms : {FTP, SMTP, URL, IP address, IaaS, Trash, Draft, SaaS}

(viii) The following algorithm is used to select players for a Rugby pool. The selection is done based on the height, weight, and age of the player.

```
If((Age>=21) AND (Height>=160 OR Weight>=70))
        Output "Qualified for the pool"
Else
        Output "Not qualified for the pool"
```

The age, height, and weight of three candidates are given below.

Name	Age	Height (cm)	Weight (kg)
Nirmal	21	159	71
Rajeev	36	165	72
Saleem	25	150	69

Write down the names of all players who are qualified for the pool.

(ix) (a) Write down **one** recommendation to avoid the Computer Vision Syndrome (CVS).

(b) Write down **one** proper method for electronic waste (e-waste) management.

(x) Write down **two** advantages of computerized Database Management Systems (DBMS).

2. (i) Match the descriptions labelled Ⓐ – Ⓓ with the correct terms from the list of terms given below and write down the relevant term number against each label in the **label ⟶ term number** format.

Label	Description
Ⓐ	Used to connect two or more computer networks
Ⓑ	Used in satellite communication to transmit data
Ⓒ	Used to transmit data using reflection of light
Ⓓ	Used in connecting TV antenna and analog CCTV cameras

List of terms : {1 – Coaxial Cable, 2 – Fibre Optics Cable, 3 – Microwaves, 4 – Modem, 5 – Radio Waves, 6 – Repeater, 7 – Router, 8 – Unshielded Twisted Pair Cable}

(ii) Consider the following statements labelled Ⓟ – Ⓢ and the two words given against each statement within square brackets. Write down the statement label and the appropriate word corresponding to the blank in each of the statements in the **label ⟶ word** format.

Ⓟ The quality of a given digital image is determined by the .... [*ppm*, *dpi*] value.

Ⓠ .... [*RGB*, *CMYK*] primary colour model is widely used in computer screens.

Ⓡ Image files such as JPEG and TIFF that are compressed using .... [*lossy*, *lossless*] compression facilitates fast downloading from the Internet.

Ⓢ .... [*Vector*, *Raster*] images can be created using software such as Adobe Photoshop and GIMP.

(iii) Match the descriptions labelled Ⓚ – Ⓝ with the correct terms from the list of terms given below and write down the relevant term number against each label in the **label ⟶ term number** format.

Label	Description
Ⓚ	Releasing unsuitable photographs of young girls on the Internet and making use of such images for threatening or blackmailing
Ⓛ	The act of presenting another's creative work as one's own
Ⓜ	The gap between those who have access to Information and Communication Technology (ICT) and those who do not
Ⓝ	Deceiving users via email to collect their credit card information

List of terms : {1 – Misuse of Social Media, 2 – Phishing, 3 – Plagiarism, 4 – Cybercrime, 5 – De-Skilling, 6 – Digital Divide}

3. Following are the **partly shown** database tables that are used to store details about food items, purchases and suppliers of a school canteen. The canteen sells food items which are purchased from the suppliers.

Table: Item

(Contains data of the items available in the canteen with their selling prices in Rupees.)

Item_ID	Item_Name	Selling_Price
F001	Tea bun	40
F002	Fish roll	70
F003	Chicken roll	65
F004	Vegetable roll	60

Table: Purchase

(Contains data of the purchasing prices of items from different suppliers. Note that a particular food item can be purchased from many suppliers for different prices.)

Item_ID	Supplier_ID	Purchasing_Price
F001	S007	30
F001	S004	35
F003	S001	60
F004	S004	55

Table: Supplier

(Contains data about suppliers.)

Supplier_ID	Supplier_Name	Supplier_Location
S001	Saman	Maradana
S002	Raj	Borella
S003	Sharaf	Dematagoda
S004	Shane	Maradana

(i) (a) Write down the *primary key* of the **Purchase** table.

(b) Write down the *foreign keys* in the **Purchase** table.

(ii) Which tables need to be updated to accommodate the following?

(a) The supplier S004 changes his location (Supplier_Location) to Rajagiriya.

(b) The canteen decides to increase the selling price of a fish roll to 80 Rupees due to a 10 Rupee price increase by the supplier.

(iii) A new supplier Kamal (**Supplier_ID: S008**) from Wellawatte starts supplying vegetable rolls to the school canteen for 50 rupees. Write down the new record(s) to be added to the relevant table(s) for the above change. Use the *tablename* → (*field1*, *field2*, ...) format for each new record.

(iv) What are the appropriate tables to be joined to write a query to find the names of the suppliers who supply fish rolls to the canteen?

4. (i) Use the following list of terms in answering questions (a) and (b).

List of terms : {Mozilla Firefox, Google, IaaS, HTTP, Pascal, PHP, Twitter, WordPress, Joomla, Internet Explorer}

(a) Match the descriptions labelled Ⓐ–Ⓓ with the correct terms from the list of terms given above and write down the relevant term against each label in the **label → term** format.

Label	Description
Ⓐ	Search engine
Ⓑ	Internet service protocol
Ⓒ	Commonly used programming language for dynamic web development
Ⓓ	Social network

(b) Identify the most suitable term to fill each blank labelled Ⓟ–Ⓢ from the list of terms given above and write down the relevant term against each blank label in the **label → term** format.

- Web pages can be developed using a Content Management Systems (CMS) such as ………Ⓟ……… and ………Ⓠ……… .

- The public can access a website through a web browser such as ………Ⓡ……… or ………Ⓢ……… .

(ii) The HTML source of the web page shown in Figure 1 is given in Figure 2 with certain missing tags labelled ❶ to ❿.

You are required to write down the label number and the corresponding HTML tag selecting from the list given below.

List : {title, h2, ul, li, table, tr, th, td, img, src, center, a}

Sri Lanka's strong vaccination programme assisted in controlling COVID-19

Sri Lanka has made great progress in controlling the spread of COVID-19; however, the threat is not over yet.

- **Progress of COVID-19 Immunization as of 11.04.2022**

Type of Dose	Number of Vaccinations	% of Population
First Dose	17,033,222	77.6%
Second Dose	14,449,321	65.9%
Booster Dose	7,959,881	36.1%

- **Monthly Covid 19 active cases in Sri Lanka from 2020 to 2022**

For further information: World Health Organization

Figure 1: Web page

```
<html>
<head> <❶> Covid 19 Vaccination in Sri Lanka </❶> </head>
<body>
<center> <❷> Sri Lanka's strong vaccination programme assisted in controlling COVID-19 </❷>
    </center>

Sri Lanka has made great progress in controlling the spread of COVID-19; however, the threat is
not over yet.

<❸>
   <❹><h3>Progress of COVID-19 Immunization as of 11.04.2022</h3></❹>
<❺ border="4" align="center">
  <❻>
     <❼>Type of Dose</❼>
     <❼>Number of Vaccinations</❼>
     <❼> % of Population </❼>

  </❻>
  <❻>
     <td>First Dose </td>    <td>17,033,222 </td>    <td> 77.6% </td>
  </❻>
  <❻>
     <td>Second Dose</td>    <td>14,449,321</td>     <td> 65.9% </td>
  </❻>
  <❻>
     <td>Booster Dose</td>    <td>7,959,881</td>     <td> 36.1% </td>
  </❻>
</❺>

<❹><h3>Monthly Covid 19 active cases in Sri Lanka from 2020 to 2022</h3></❹>

<❽> <❾ src="active_cases.png" width="400" height="180" alt="Vaccine Photo"> </❽>

</❸>
<p>
<h3> For further information: <❿ href="https://www.who.int/srilanka">  World Health Organization
    </❿></h3>
<p>

</body>
</html>
```
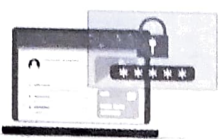
Figure 2: HTML Source

5. (i) Segment of a word-processed document is shown below with some formatting done. These formatting tasks are labelled as ① – ⑤. Before formatting, all the text in the original document had the same font size.

Protect Yourself against Cyber Attacks ⟵——— ①

②

You can avoid cyber risks by taking steps in advance:

⟵——— ③

④
- Limit the personal information you share online
- Create strong passwords by using letters, numbers, and special characters
- Use antivirus and anti-malware solutions, and firewalls to block threats
- Do not click on hyperlinks in emails received from unknown sources.

⑤

Source: https://www.ready.gov/cybersecurity

Following are the icons of some formatting tools in a word processing software:

Icon of the formatting tool	≔	*I*			A▲	Picture	U	A
Icon label	℗	ℚ	ℝ	⑤	ⓉT	Ⓤ	Ⓥ	Ⓦ

Identify the icons of formatting tools, indicated by the labels ℗ – Ⓦ which are required to do the formatting tasks indicated by the labels ① – ⑤. Write down the label of each formatting task ① – ⑤ and its matching icon label of the formatting tool in the **task label → icon label** format.

(ii) The following spreadsheet segment shows some statistics of road accidents reported for 2018.

▲	A	B	C	D	E
1	**Accident Data for Year 2018**				
2		**Type of Accident**			
3	**Vehicle Type**	Fatal	Minor	Critical	Damages
4	Motor Cycles	1,227	4,524	3,382	1,358
5	Lorry	344	1,022	843	1,668
6	Dual Purpose Vehicle	318	1,396	977	1,668
7	Private Buses	237	653	498	1,046
8	Three - Wheelers	365	2,496	1,354	`1,728
9	SLTB Buses	62	232	189	269
10	Motor Cars	210	1,486	952	3,036
11	Cycle	42	108	71	62
12					
13	**Total -Accidents**	2,805	11,917	8,266	10,835
14	**Lowest value-Critical**			71	
15	**Highest value-Accidents**	4,524			
16					

(a) Write down the correct formula in the form of *=function(cell1:cell2)* that should be entered in cell B13 to find the total number of vehicles involved in fatal accidents.

(b) Assume that the formula entered into the cell B13 is copied to cell range C13:E13. Write down the formula displayed in the cell D13.

(c) Write down the formula in the form of *=function(cell3:cell4)* that should be entered in cell D14 to get the lowest value recorded for critical accidents.

(d) Write down the appropriate cell range in the form of *(cell5:cell6)* for the formula written in cell B15 to identify the highest number of any accident.

(e) Write down the most suitable chart type available in spreadsheet software from the given list of charts for the following:

   (1) To show comparisons of the types of accidents involving each vehicle type in the same graph.

   List of charts for part (1): {Area, Bar, Pie, Scatter}

   (2) To show the number of fatal accidents for each vehicle type.

   List of charts for part (2): {Area, Line, Pie, Scatter}

6. (i) Aruni is an O/L student. In addition to her studies, she writes essays that she submits to various newspapers. She has stored a considerable number of mp3 files in her computer. In addition, many digital pictures that she has taken are also stored on her computer. Her parents have also asked her to store all the online payment receipts on her computer as well.

Aruni stores **all** the files related to the above, in **one** single folder (directory) on her computer.

(a) Write down a problem that Aruni might face when searching a particular file in the existing storage scheme.

(b) Following folder structure is suggested for Aruni. Match the folder labels against the folder names given in the list, in the **folder label → name** format.
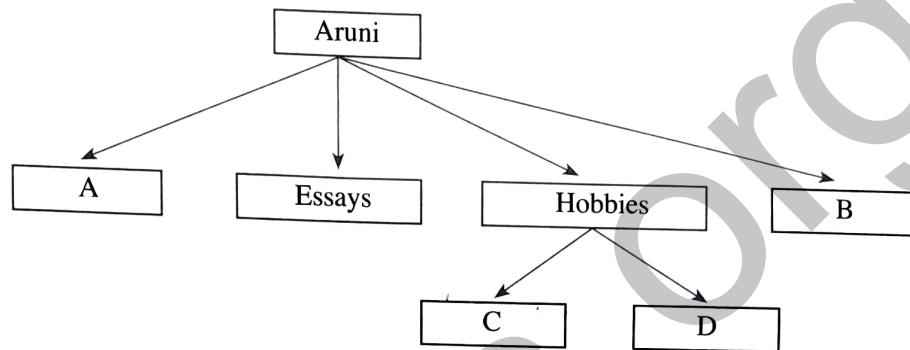
List of folder names : {Receipts, Music, Pictures, Studies}

(c) Write **one** practice Aruni can follow to avoid her hard disk becoming full.

(d) Write **one** practice that Aruni could have followed to avoid losing data in the event of a computer failure.

(ii) A hospital is planning to introduce a new computerized system to overcome the issues in the existing patient management system. A team was assigned to do the development of the above system.

(a) The team decides to develop the system in small portions allowing the hospital management to provide regular feedback. What is the most suitable system development life cycle model that the team should use?

(b) The hospital management conducts a testing session to decide whether the newly developed system can be approved or not. What is the test that the hospital management should perform?

(c) The hospital management wanted to terminate the existing system immediately and replace it with the newly developed one. What is the deployment method wanted by the hospital management?

(d) The development team suggested introducing the new system initially to the Kandy branch of the hospital before deploying it to all other branches. What is the deployment method suggested by the development team?

(iii) A school library is planning to introduce a computerized library management system to replace the existing manual system. List **two** techniques that could be used for requirement identification.

7. (i) Answer parts (a) and (b) based on the following pseudocode:

```
BEGIN
  counter = 0,   x = 0
    WHILE  counter<20
      DISPLAY "Enter a Number"
      READ num
      x = x + num
      counter = counter + 1
    ENDWHILE
  DISPLAY x
END
```

(a) What is the exact purpose of the above pseudocode?

(b) What would happen if the statement "counter = counter + 1" is removed from the pseudocode?

(ii) A teacher asked from 50 students to choose their preferred travel destination (either Kandy or Galle) for the annual school trip. The destination will be decided based on the highest student preference. The following flowchart with blanks labelled from Ⓐ to Ⓕ represents this scenario.
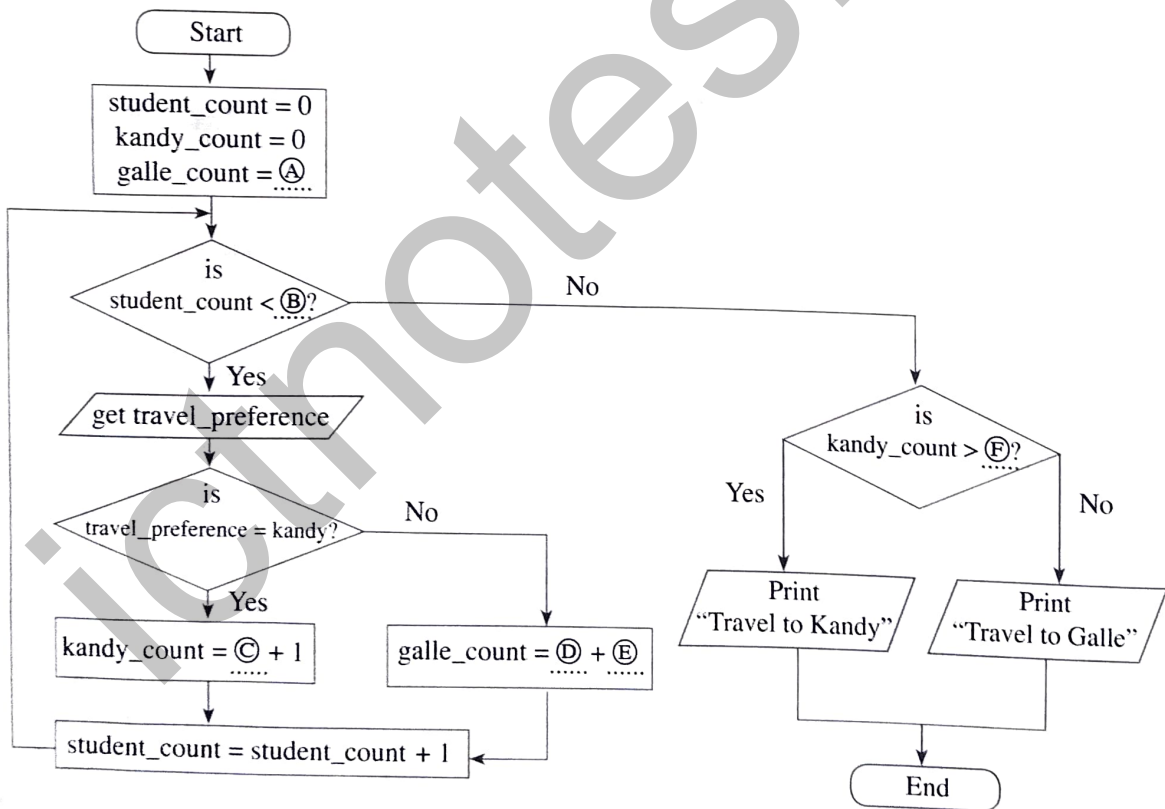
Write down the appropriate answers to match the labels Ⓐ to Ⓕ in the **label → answer** format.

* * *