

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විදුලි සන්නිවේදන දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව  
 இலங்கைப் பரீட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம்  
 Department of Examinations, Sri Lanka இலங்கைப் பரීட்சைத் திணைக்களம் Department of Examinations, Sri Lanka இலங்கைப் பரීட்சைத் திணைக்களம்  
**80 E I, II**

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2018 දෙසැම්බර්  
 கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2018 டிசெம்பர்  
**General Certificate of Education (Ord. Level) Examination, December 2018**

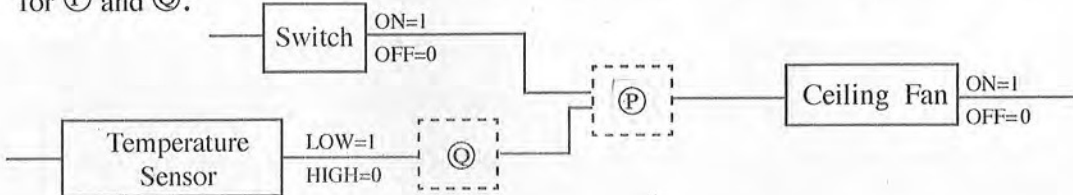
තොරතුරු හා සන්නිවේදන තාක්ෂණය I, II  
 தகவல் தொடர்பாடல் தொழினுட்பவியல் I, II  
**Information & Communication Technology I, II**

**Information & Communication Technology II**

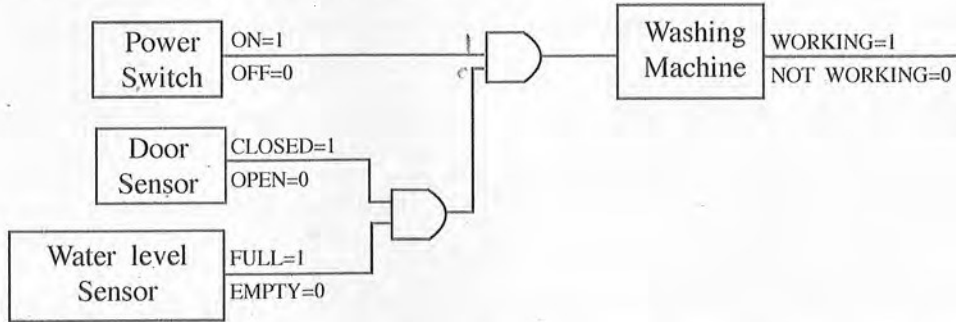
\* Answer five (05) questions only, including the first question and four others.  
 \* First question carries 20 marks and each of the other questions carries 10 marks.

1. (i) If character 'm' is represented in the ASCII table as 109<sub>10</sub> write down the binary representation of the word 'no' using 7 bits for each character.

(ii) (a) Consider the following simplified logic circuit, which is designed to switch on a ceiling fan when temperature is HIGH while the power switch is ON. Write down the two relevant logic gates for P and Q.



(b) Consider the following simplified circuit of a washing machine:



The following is the truth table equivalent to the above logic circuit. Write down labels (A) - (H) and the corresponding truth value (1,0) of each label.

Power switch	Door sensor	Water level sensor	Washing machine
OFF (0)	OPEN (0)	EMPTY (0)	.....(A).....
OFF (0)	OPEN (0)	FULL (1)	.....(B).....
OFF (0)	CLOSED (1)	EMPTY (0)	.....(C).....
OFF (0)	CLOSED (1)	FULL (1)	.....(D).....
ON (1)	OPEN (0)	EMPTY (0)	.....(E).....
ON (1)	OPEN (0)	FULL (1)	.....(F).....
ON (1)	CLOSED (1)	EMPTY (0)	.....(G).....
ON (1)	CLOSED (1)	FULL (1)	.....(H).....





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- (iii) (a) What is the main difference between *waterfall life cycle model* and *iterative incremental life cycle model*?  
 (b) List **one** advantage of *iterative incremental life cycle model*.
- (iv) Assume that a desktop computer was purchased and you are asked to connect different peripheral devices to it. **Tasks** column shown below lists the tasks to be carried out for this purpose and the **Port** column shows ports or connectors to be used. Match each task to the relevant port and write down the task number and the matching port label.

Task
Task 1 – Connect the LED display to the system unit
Task 2 – Connect keyboard and the mouse
Task 3 – Connect network cable
Task 4 – Connect the power cable

Port
(A) – 
(B) – 
(C) – 
(D) – 

- (v) Consider the following phrase before and after formatting using word processing software: (Assume that the font size of the phrase has not been changed.)

**Before formatting** : Essential 21st Century Skills for Today’s Students

**After formatting** : *Essential 21<sup>st</sup> Century Skills for Today’s Students*

Write down the word processing software tools required for the above formatting.

- (vi) The column on the left lists three types of cloud computing services (labeled (A)-(C)) and the column on the right describes some of the services provided by each (labeled (X)-(Z)). Match items in the two columns and write down the corresponding pairs using their labels.

(A) – Infrastructure as a service (IaaS)	(X) – Provides software installed in the cloud [Example: <i>Google Docs</i> ]
(B) – Software as a Service (SaaS)	(Y) – Provides necessary server environment for software development [Example: <i>Google App Engine</i> ]
(C) – Platform as a Service (PaaS)	(Z) – Provides facilities such as servers, network, storage, etc. [Example: <i>Amazon Web Services (AWS)</i> ]

- (vii) Following gives four different scenarios labelled (S1) - (S4) that require different communication methods:

- (S1) - A manager of a bank, while in Sri Lanka, joining a meeting held in their Head Office in India
- (S2) - A secretary sending a softcopy of a report from her manager to all employees working in a different city
- (S3) - A technical officer sending a message to his manager informing that the machine has been repaired
- (S4) - A marketing manager sharing photos of a community service project and obtaining feedback from customers as comments

Identify the **most suitable** communication method for each of the above scenarios from the list given below and write down label number and communication method.

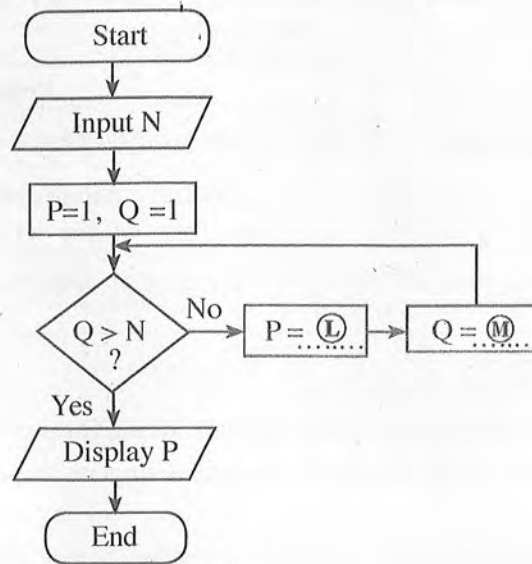
**List** : {*blog, email, instant messaging, social network, video conferencing*}

(viii) How many different colours can be represented if 10 bits per pixel (bpp) is used as *colour depth* in an image?

(ix) Consider the given flowchart that finds the product of an integer with all the integers below it.

(E.g. : If N is the given integer then the product =  $1 \times 2 \times 3 \dots \times N$ )

Ⓐ and Ⓑ are expressions to be completed.



(a) Write the correct expressions for Ⓐ and Ⓑ, respectively.

(b) If N = 4, write down the final values of P and Q when the algorithm reaches the end.

(x) Consider the **Employee** and **Division** tables given below:

Emp_Name	Emp_ID	Designation	Div_ID
Saman Perera	E1	Manager	Ⓐ
Raj Selvam	E2	Engineer	Ⓑ
John Allison	E3	ICT Officer	Ⓒ
Fazal Khan	E4	Accountant	Ⓓ

**Employee table**

Division_Name	Division_Number	Division_Location
Finance	1	Colombo 1
Stores	2	Colombo 2
Sales	3	Colombo 3

**Division table**

(a) Assume that a new division named *IT* located in *Colombo 3* is to be added. Write down the new record that has to be added and the corresponding table name.

(b) Saman and John work at *Stores*. Fazal works at *Finance Division*. Raj recently joined the *IT Division*. Write down the correct values for labels Ⓐ - Ⓓ in **Employee** table to represent this information.

2. (i) People who work with computers for long periods sometimes complain of certain health issues.

The following shows the **Health Issues** (labeled Ⓐ - Ⓒ), **Possible Reasons** (labeled Ⓔ - Ⓘ) and **Possible Solutions** (labeled Ⓟ - Ⓡ).

Match each health issue Ⓐ - Ⓒ, with a possible reason Ⓔ - Ⓘ and a possible solution Ⓟ - Ⓡ and write down using their labels.

(Note: There can be more than one possible solution for a given health issue. However, you are required to write only *one* solution.)

Health Issue	Possible Reason
Ⓐ - Carpel Tunnel Syndrome	Ⓔ - Poor posture or a non-ergonomically designed work space
Ⓑ - Computer Vision Syndrome (Digital Eye Strain)	Ⓕ - Painful compression of a nerve as it passes across the front of the wrist
Ⓒ - Musculoskeletal disorder	Ⓗ - Looking at computer screen for prolonged periods

#### Possible Solutions

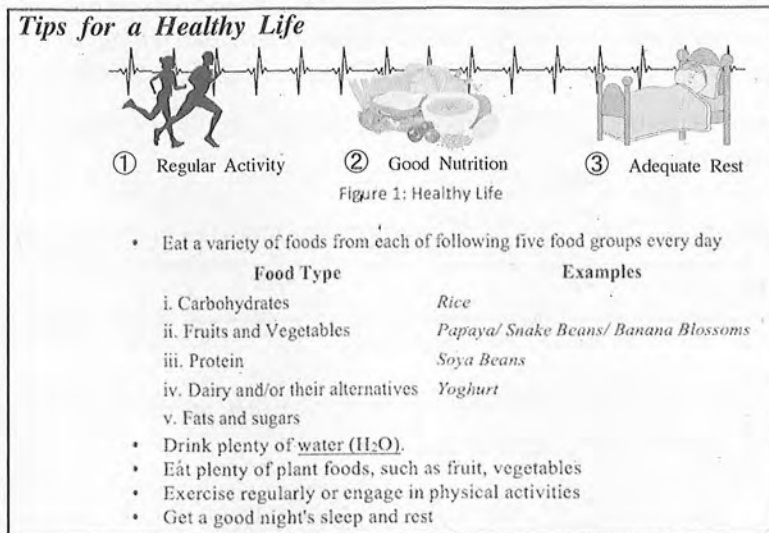
- Ⓟ - Rest the eye muscles by looking up and staring for a moment at objects in the distance
- Ⓠ - Stand up and stretch the back, arms and fingers frequently
- Ⓡ - Take regular short breaks from a repetitive task by using an alarm as a reminder
- Ⓢ - Avoid bending the wrists and keep the arms, wrists and fingers aligned when typing
- Ⓣ - Use keyboard shortcuts to reduce typing and mouse movements
- Ⓤ - Avoid hitting the keys too hard while typing / use *touch typing*
- Ⓥ - Position the computer screen to avoid glare / use curtains or drapes on windows
- Ⓡ - Keep the computer screen about 15 to 20 degrees below eye level.

- (ii) For each of the issues (labelled Ⓐ-Ⓓ) below, identify the relevant term from the list and write down the term against each relevant label.

- Ⓐ - A person receiving an email that appears to have come from a well-known organization and asking for personal information such as the credit card number, the user name and the password of the person's online banking facility
- Ⓑ - The practice of taking someone else's work and publishing them off as one's own
- Ⓒ - A person having unauthorized access to a computer network and accessing personal information such as names and addresses of customers
- Ⓓ - A person selling unauthorized copies of a licensed software at a 5% of the original price

**List of terms :** {fair use, forgery, hacking, phishing, plagiarism, piracy, spam}

3. (i) The HTML source of the web page shown in **Figure 1** is given in **Figure 2** with certain missing tags and parameters labelled ① - ⑧.



**Figure 1 web page**

```

<!DOCTYPE html>
<html>
<body>
<h2><①>Tips for a Healthy Life</①></h2>
<②><img ③="health.jpg" ④="Healthy Life" width="460" height="345"></②>
<p><②> Figure 1: Healthy Life</②></p>
<⑤>
<li>Eat a variety of foods from each of following five food groups every day</li>
<⑥>
<tr>
<th>Food Type</th>
<th>Examples</th>
<tr>
<td>i. Carbohydrates</td>
<td><i>Rice</i></td>
<tr>
<td> ii. Fruits and Vegetables</td>
<td> <i>Papaya/ Snake Beans/ Banana Blossoms</i> </td>
<tr>
<td>iii. Protein</td>
<td> <i>Soya Beans</i> </td>
<tr>
<td>iv. Dairy and/or their alternatives </td>
<td> <i>Yoghurt</i> </td>
<tr>
<td> v. Fats and sugars </td>
<tr>
</tr>
</⑥>
<li>Drink plenty of <⑦ href="https://www.purewaterfortheworld.org">water
(H<⑧>2<⑧>O)</⑦>.</li>
<li>Eat plenty of plant foods, such as fruit, vegetables</li>
<li>Exercise regularly or engage in physical activities</li>
<li>Get a good night's sleep and rest </li>
</⑤>
</body>
</html>
    
```

**Figure 2 The HTML Source code**

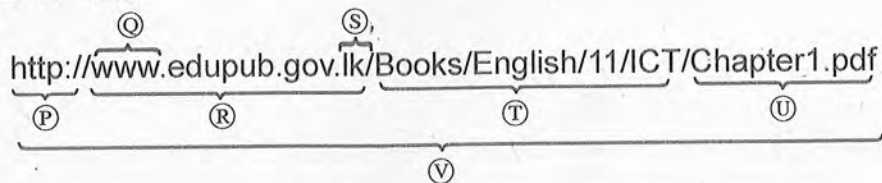
Select the matching correct tag or parameter from the following list for each of the labels ① - ⑧ given in **Figure 2** and write down against each label number.

**List of terms :** {a, alt, b, br, center, dl, href, i, img, li, ol, p, src, sub, sup, table, td, th, tr, ul}

(ii) Use the following list of terms in answering questions (a) and (b) below.

**List of terms :** { DNS server, domain name, FTP, IP address, mail server, path to resource, protocol, resource, SMTP, spam mail, streaming server, top level domain, uniform resource locator (URL), web server, World Wide Web (WWW) }

(a) Identify the correct term from the above list for labels (P) - (V) below and write the correct terms against the label.



(b) Match the descriptions given in (A) - (D) with the correct terms from the list given above and write down the relevant term against the label.

(A)	Delivers web pages to clients using HTTP
(B)	Helps uniquely identify a computer on the internet
(C)	Every email that is sent passes through a series of this type of servers along its way to its intended recipient
(D)	Unwanted email messages

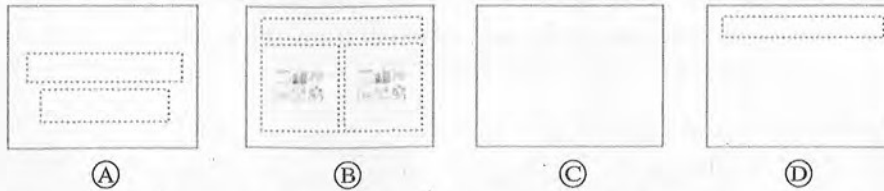
4. (i) Consider the spreadsheet segment given below containing prices of two models of laptop computers and their accessories.

	A	B	C
1	Description	Price (Rs.)	
2		Model A	Model B
3	Laptop computer	64000	71000
4	Bag	1500	1750
5	Mouse device	450	500
6	Total	65950	
7	Total Including delivery Cost	66300	73600
8			
9			
10	Delivery Charge (City limits)	350	
11			

The delivery cost is Rs. 350 and this cost is shown in cell B10. "Total" and "Total including Delivery Cost" are to be calculated for the two models.

- Write down the formula that should be entered in cell B6 to calculate the 'Total' for Model A in the form of `=function(cell1:cell2)`.
- If this formula is copied to cell C6, what value will be displayed in C6?
- Write down **two** formulae that can be written in cell B7 to calculate the "Total including Delivery Cost" using **only** cell addresses, functions and arithmetic operators.
- If the formula in cell B7 was copied to cell C7, and value shown in C7 was 73600, what formula is in cell C7?

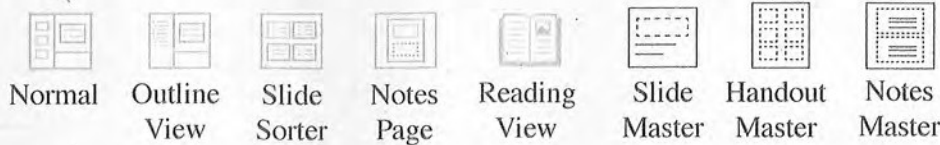
(ii) (a) Consider the presentation software slide layouts shown as (A) - (D) :



Identify the correct name of each layout from the list of names given below and write it down against the layout label.

List: {Title slide, Blank slide, Title & content slide, Title only slide, Section header slide, Two Content slide}

(b) Which of the following views is the most suitable to arrange the positioning of slides?



5. Assume that the following is a part of the relational database of a business information system. This business has shops in certain schools in different parts of the country.

Month	ShopID	Sales
January	001	12400
March	001	18700
December	003	15330
February	001	11230
March	002	16330

Sales Table

Category	Items
A	Ice Cream & Milk
B	Milk
C	Milk & Stationery

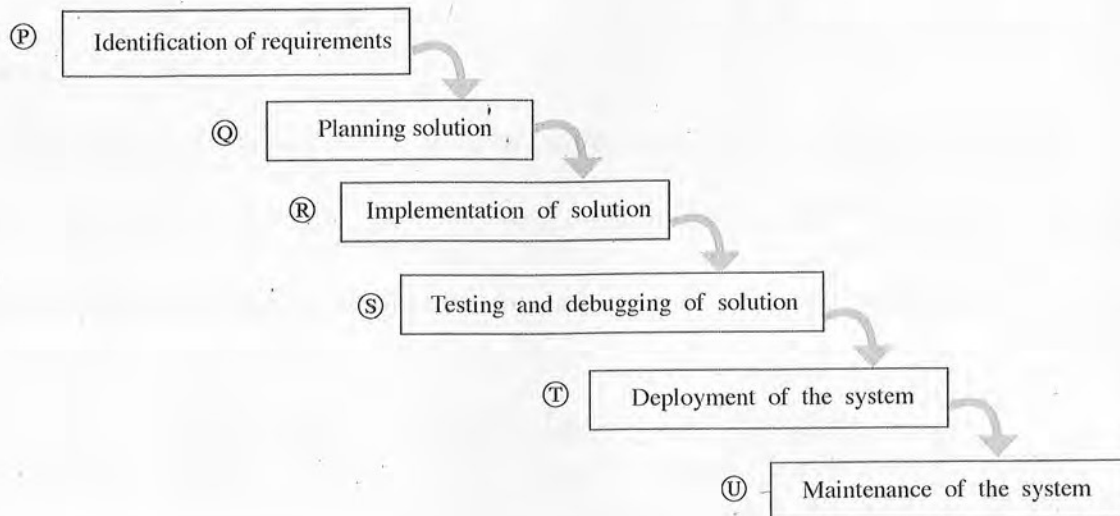
Category Table

Name	ShopID	Category
ABC College	001	A
PQR Central College	002	B
XYZ College	003	C

Branch Table

- (i) Write down **two** primary keys and their respective table names.
- (ii) Write down **two** foreign keys and their respective table names.
- (iii) What table should be modified to include the telephone number of each shop?
- (iv) Which tables should be joined to run a query to find out the total sales at ABC College?
- (v) Assume that a new shop with ShopID 004 selling Milk & Photocopying services is opened at HIJ College. What tables need to be updated to include the given information?
- (vi) Write down the newly added records as specified in (v) above along with the respective table names.

6. (i) A team who participated in developing a school management system, listed **some** of the activities they carried out with respect to it as (A) - (G) below. The phases of the system development life cycle that was used are labelled from (P) to (U).



**Activities:**

- (A) - Using the existing manual system and the newly developed system in parallel for three months; Discontinuing the manual system at the end of the third month
- (B) - Converting the designs of processes, database model and user interfaces etc. into software programs
- (C) - Meeting the principal, teachers, librarian and others to identify the current processes
- (D) - Collecting samples of term test mark sheets, library catalogue, lending cards, daily attendance sheets etc.
- (E) - Interviewing the principal, librarian and sectional head teachers to understand their expectations of the new system and the current problems they face
- (F) - Rewriting parts of code to accommodate a change requested by the principal after using the new system for one year
- (G) - Debugging the system due to an error being pointed out by the librarian after six months of new system usage

- (a) Identify what activities in (A) - (G) are relevant to the life cycle phases (P) - (U) and write down the matching pairs.
- (b) List **three** employment opportunities in the ICT field.

- (ii) The following three statements labelled (X), (Y) and (Z), describe three types of software testing:

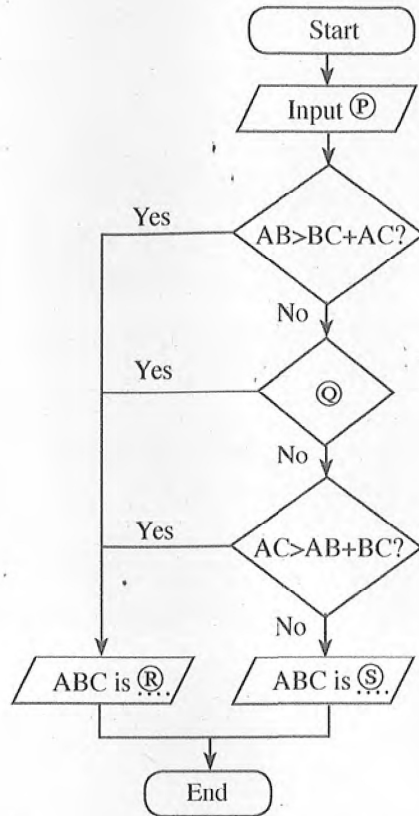
- (X) - Individual components of software are tested separately to check if they function properly by producing correct output for the given inputs.
- (Y) - End users test the system to evaluate whether the system is suitable for use.
- (Z) - Individual components of the software are combined and tested to see if they work together properly.

Identify the correct test types from the following list and write them down against the labels (X) - (Z).

**List of terms :** {acceptance testing, integration testing, system testing, unit testing}



7. The following flowchart uses the rule that the sum of any two lengths must be greater than the remaining length in a triangle. Assume that AB, BC and AC are the lengths of a triangle.



- (i) Write down the correct expressions for missing labels P, Q, R and S in the flowchart.
- (ii) If the three decision boxes in the flowchart are combined into a **single** decision box, write down the expression that should be used in that single decision box.
- (iii) Write pseudocode representing the logic of the updated flowchart, including the changes that were done in (i) and (ii) above.
- (iv) When one or more of the input lengths become zero, this algorithm fails to function properly. Write the pseudocode condition that has to be introduced between the input and the first decision box in the **original** flowchart to fix this problem.

\* \* \*