

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

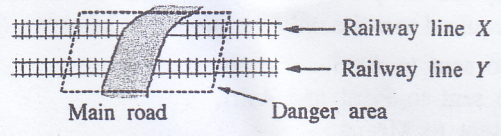
අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2015 දෙසැම්බර්
 கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2015 டிசெம்பர்
 General Certificate of Education (Ord. Level) Examination, December 2015

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

Information & Communication Technology II

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

1. (i) A main road crosses two parallel railway lines X and Y. An alarm bell should ring when a train enters the danger area on any of the lines from any direction (see figure).



The truth table below is given to indicate the operation of the alarm bell.

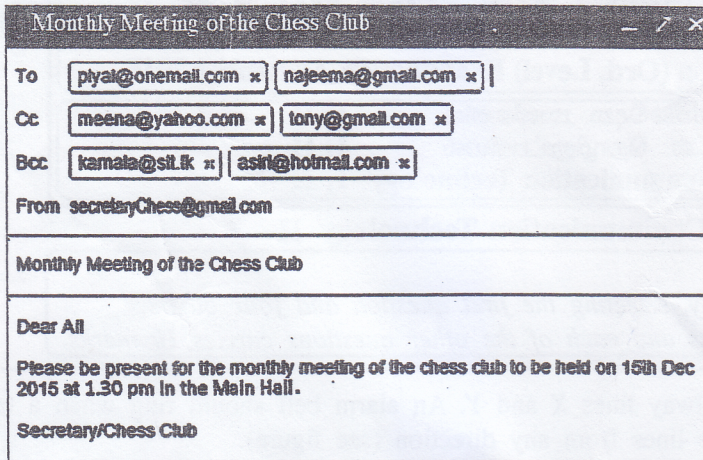
P	Q	State of bell (Z)
0	0	
0	1	1
1	0	1
1	1	1

Note :
 P - A train has entered ('1') or not entered ('0') the danger area of line X.
 Q - A train has entered ('1') or not entered ('0') the danger area of line Y.
 State of bell (Z):
 Bell is ringing - '1'
 Bell is not ringing - '0'

Copy the above truth table to your answer script and fill the last column (Z).

- (ii) A basic rule (axiom) in Boolean algebra is: $x + \bar{x} = 1$. This rule can be proved using a logic circuit with a two-input OR gate and a NOT gate. Draw the relevant logic circuit diagram to illustrate the proof of the above rule.
- (iii) A tourist takes photographs of interesting places in Sri Lanka using the built-in camera of his tablet computer and saves the captured images on the hard disk of the device. Later, he edits the images using the touch screen and copies them to a USB drive. Identify and write down two input devices and two storage devices used in the above scenario.
- (iv) Consider the following scenarios:
 X - A bank providing internet banking facilities to its customers to transfer money, pay bills such as electricity, telephone etc.
 Y - An organization using an isolated computer network within a building (i.e., without any connection to the outside world)
 Z - A network linking a head office of a company in Colombo with its branches in the city
 Identify and write down the type of computer network involved in each of the above instances X, Y and Z from the list given below:
 List: {Local Area Network (LAN), Metropolitan Area Network (MAN), Wide Area Network (WAN)}
- (v) Convert the binary 11010101_2 to the equivalent octal number. Show your steps.

- (vi) In the ASCII code, the letter A is represented as decimal 65. Determine the binary representation of the letter D.
- (vii) Consider the following figure showing a mail sent to Piyal, Najeema, Meena, Tony, Kamala and Asiri by the Secretary of the Chess Club of a school.



Assuming that the mail was received by the recipients in the list, write down whether the following statements are **True** or **False**. (You are required to write only the statement label (a)-(d) and **True/False**.)

- (a) Kamala sees that the mail was also sent to Asiri.
 - (b) Meena sees that the mail was also sent to Piyal and Asiri.
 - (c) Tony sees that the mail was also sent to Meena.
 - (d) Piyal sees that the mail was also sent to Najeema.
- (viii) Second column of the following table shows some icons used in an image editing software. Identify and write down the correct names for the icons from the given list. (You are required to write only the icon label ① - ④, and the name.)

Label	Icon
①	
②	
③	
④	

List: {brush tool, clone stamp tool, crop tool, hand tool, lasso tool, magic wand tool, move tool}

- (ix) Consider the following two categories A and B. Category A consists of some activities of the system development life cycle (SDLC) while Category B contains some terms relevant to the activities listed under Category A.

Category A	Category B
① Coding	Ⓟ Interfaces
② Feasibility study	Ⓞ Interviews
③ System analysis	Ⓜ Monetary resources
④ System design	Ⓢ Programming language

Write down the four matching pairs using the given labels.

- (x) Consider the execution of the following code segment containing a while loop.

```
sum = 0
N = 16
while N >= 10
    sum = sum + N
    N = N - 2
end while
```

Cycle No.	sum	N
1		
2		
3		
4		

Copy the above table to your answer sheet and fill it using the values assigned for *sum* and *N* after the execution of each cycle in the while loop.

- (i) Consider the following spreadsheet segment giving some statistics related to certain education indicators for Sri Lanka.

	A	B	C	D
1	Education Indicators: General Education 2008-2013			
2	Item	2008	2010	2013
3	Total Schools	10,445	10,502	10,849
4	Govt. Schools	9,662	9,685	10,012
5	Private	92	98	103
6	Pirivenas	691	719	734
7	Total Students	4,101,509	4,119,525	4,231,259
8	Govt. Schools	3,930,374	3,940,072	4,037,157
9	Private	115,070	117,362	127,986
10	Pirivenas	56,065	62,091	66,116
11	Total Teachers	224,410	224,541	239,245
12	Govt. Teachers	213,212	212,457	226,983
13	Other (Private School & Pirivenas)	11,198	12,084	12,262
14	Student/Teacher Ratio (Govt. Schools)			

Sources:

1. Statistical Handbook 2010 of National Science Foundation
2. Education Information - Ministry of Education

- (a) What is the single spreadsheet function that can be used in cell B3 to display the total number of schools for 2008?
- (b) What will be the formula displayed in C3, if the formula in B3 is copied to C3?
- (c) "Student/Teacher Ratio (Govt. Schools)" is calculated by dividing the number of students in government schools by the total number of teachers in government schools. What is the formula to be written in cell B14 to display the student/teacher ratio (Govt. schools) in 2008?
- (d) Suggest the most suitable graph type to show the comparison between the numbers of government schools, private schools and pirivenas for the given three years.
- (ii) State whether the following statements regarding spreadsheets are **True** or **False**:
(You are required to write only the statement number (a) – (f) and **True/False**.)
- The autofill facility can be used to copy a formula to a range of adjacent cells.
 - Text entries in cells get right aligned automatically by default.
 - It is possible to get cell borders to appear on a spreadsheet printout.
 - It is possible to hide rows and columns in a spreadsheet.
 - By pressing Control+Home keys the cursor is moved to cell A1.
 - When Control+Pageup keys are pressed, the active cell jumps to the next worksheet.

3. The XYZ Sports is a shop that sells sports items which are supplied to the shop by several suppliers. The shop maintains a database with three tables to store the items currently in stock, their suppliers and items purchased from the suppliers, as shown below.

ItemID	IName	Stock
P01	Football	15
P02	Bat	25
P03	Netball	18
P04	Volleyball	10

Item Table

SupplID	SName	Phone
S01	Nuwan	1234567
S02	Rita	5678123
S03	Akram	5566113
S04	Kumari	8877221

Supplier Table

Date	SupplID	ItemID	Count
11/8	S01	P03	40
12/9	S03	P03	15
13/9	S02	P01	20
14/9	S04	P02	30
16/9	S03	P04	20

Purchase Table

- (i) List **two** primary key fields and their table names in the above database system.
- (ii) The shop decides to add a new item 'Tennis ball' and purchases 30 of them from the supplier Rita on the date 22/9.
- (a) What table(s) need(s) to be updated for this event?
- (b) Write down the new record(s) in the relevant table(s).
- (iii) A customer buys one Volleyball and one Bat.
- (a) What table(s) need(s) to be updated for this event?
- (b) Write down the updated record(s) in the relevant table(s).
4. (i) Assume that your friend says "telemedicine is taking medicine from home by contacting a doctor over a phone." Explain why your friend's statement is **incorrect**. Write down an example to illustrate the correct use of telemedicine.
- (ii) Saman says that he installed a virus scanner on his home computer six months ago and that he has never had internet access at home. Explain why his computer may **not** have protection from new virus attacks.
- (iii) Explain **one** ethical issue related to the use of personal information stored on an information system. Your answer should include **one** example to illustrate an unethical act related to privacy of information.
- (iv) Your friend says that he does **not** need to backup his data as he has installed a firewall. Do you agree with him? State reasons for your answer.
- (v) Provide **two** reasons why one should **not** use pirate software. (Your answer should show issues related to pirate software.)
5. (i) Assume that the monthly payments for tea plucking employees in a tea estate are calculated based on the weight of the tea leaves that they pluck daily. The payment process is performed manually at present and it is proposed to automate the process.
- (a) State **two** methods that can be used to understand the requirements of the proposed system if the above process is to be automated.
- (b) Write down the input data and the output information of the proposed system.
- (c) Unit testing is one testing method that can be used to test the above system. Write **one** other testing method.
- (d) The newly developed software can be deployed (installed) using either a parallel implementation or a direct implementation. Which method would you use? State **one** reason for your recommendation.
- (ii) Assume that you want to find information on 'environment conservation' from the internet. The relevant activities involved are given in the list below. Write down the given activities in the correct order. (You are only required to write down the labels of the activities in the correct order.)
- List:**
- (A) - Connect to the internet using the relevant software.
- (B) - Enter 'environment conservation' as the search text.
- (C) - Log in to the computer.
- (D) - Open up a search engine.

6. (i) Consider the web page given in *Figure 1* which is to be prepared using the source code in *Figure 2*.

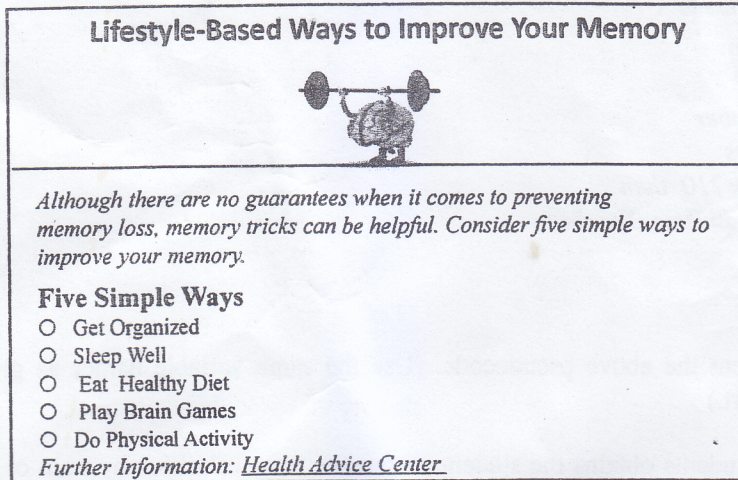


Figure 1

```

<html>
<①>
  <title>Health Tips </title>
</①>
<body>
  <②>
    <③> Lifestyle-Based Ways to Improve Your Memory </③>
    <④ SRC = "icon.jpg" ALT = "Brain Logo" border = 3> </center>
  </②>
  <⑤>
  <⑥>
    Although there are no guarantees when it comes to preventing memory loss, memory tricks can be
    helpful. Consider five simple ways to improve your memory.
  </⑥>
  <⑦> Five Simple Ways </⑦>
  <⑧ type = circle>
    <⑨>Get Organized</⑨>
    <⑨>Sleep Well </⑨>
    <⑨>Eat Healthy Diet </⑨>
    <⑨>Play Brain Games </⑨>
    <⑨>Do Physical Activities </⑨>
  </⑧>
  Further Information: <a ⑩ = "http://www.health.com"> Health Advice Center </a>
</body>
</html>

```

Figure 2

(i) The code in *Figure 2* has ten missing HTML tags indicated by labels ① to ⑩. Select the correct tags for the labels from the list given below. (Write down only the label number and the corresponding HTML tags.)

List: {TR, OL, HEAD, HREF, BODY, LI, UL, H2, H1, P, IMG, HR, TABLE, CENTER, DL}

(ii) Select from the list given below and write down, the most appropriate term/phrase for each of the blanks labelled ① to ⑤ in the following sentences. (You are required to write only the label number and the corresponding term/phrase.)

List: {switch, modem, hub, URL, web browser, web authoring software, web server}

- (a) A①..... can be used to properly view an HTML file.
- (b) A file on the web is uniquely identified by using a②.....
- (c) An HTML file can be created by using a③.....
- (d) A④..... may contain all the hypermedia documents relating to a particular organization.
- (e) A⑤..... can be used to convert analog signals to digital.

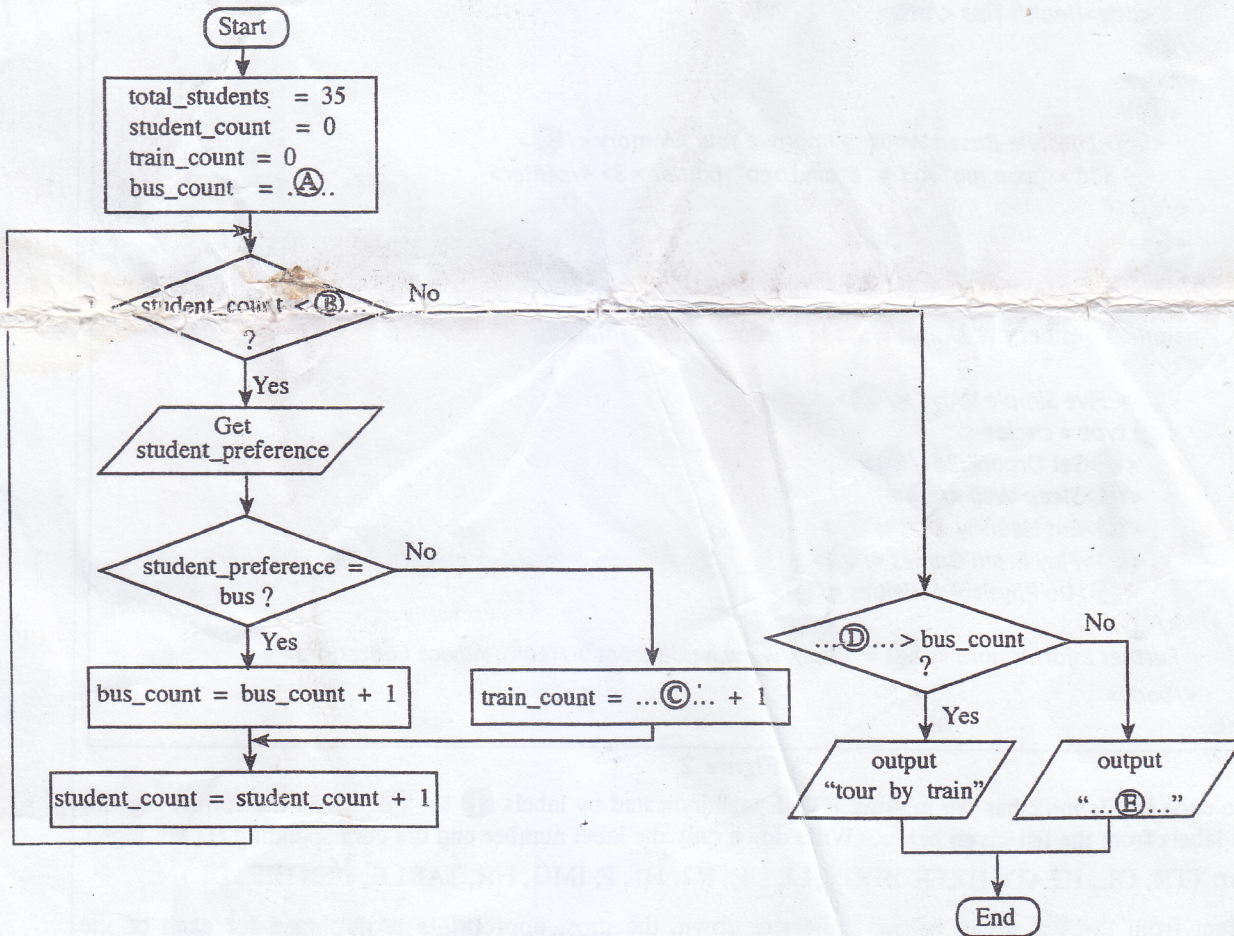
7. (i) A school has 1000 students. The following pseudocode segment prints the admission numbers of students who attended the school everyday (i.e., 210 days) in a particular year:

```

N=0
while N<1000
  get AdmissionNumber
  get NumberOfDays
  if NumberOfDays=210 then
    print AdmissionNumber
  end if
  N=N+1
end while
    
```

Draw a flowchart to represent the above pseudocode. (Use the same variable names as given in the pseudocode in your flowchart.)

(ii) A teacher of a class of 35 students obtains the student preference to travel either by train or by bus on their annual trip. The following flow chart with missing terms labelled from (A) to (E) represents this scenario.



Write down the appropriate terms for the labels (A) to (E). (Any variable names that are used in your answer must be exactly as given in the question.)

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