

## Department of Examinations - Sri Lanka

G.C.E. (O/L) Examination – 2021(2022)

# 80 – Information & Communication Technology

Marking Scheme



This document has been prepared for the use of Marking Examiners. Some changes would be made according to the views presented at the Chief Examiners' Meeting.

Amendments are to be included.

#### **දුී ලංකා විභාග දෙපාර්තමේන්තුව** இலங்கைப் பரீட்சைத் திணைக்களம்

රහසායයි

අ.පො.ස. (සා.පෙළ) විභාගය - 2021 (2022) க.பொ.த. (சா.தர)ப் பரீட்சை - **202**1 (2022)

**විෂය අංකය** பாட இலக்கம்

80

විෂ යය பாடம்

තොරතුරු හා සන්නිවේදන තාකෂණය

I පතුය - පිළිතුරු I பத்திரம் - விடைகள்

පුශ්ත අංකය <b>ඛ්න</b> ா <b>இ</b> ல.	පිළිතුරෙහි අංකය ඛ්ක <b>. මු</b>	පුශ්න අංකය ඛානා இல.	පිළිතුරෙහි අංකය ඛානය இහ.	පුශ්න අංකය <b>ඛානා</b> <b>இ</b> ல.	පිළිතුරෙහි අංකය ඛාකය இහ.	පුශ්න අංකය ඛා් <b>னா</b> இல.	පිළිතුරෙහි අංකය ඛාින <b>ட</b> இல.
01.	4	11.	3	21.	4	31.	4
02.	3	12.	3	22.	1	32.	2
03.	3	13.	1	23.	1	33.	4
04.	2	14.	1	24.	. 2	34.	2
05.	4	15.	2	25.	4	35.	1
06.	2	16.	4	26.		36.	2
07.	3	17.	4	27.	1	37.	3
08.	1	18.	4	28.	2	38.	2
09.	2	19.	3	29.	2	39.	1
10.	1	20.	2	30.	1	40.	2

**මුළු ලකුණු** / மொத்தப் புள்ளிகள்

 $01 \times 40 =$ 

**= 40** 

පහත නිදසුනෙහි දක්වෙන පරිදි බහුවරණ උත්තරපතුයේ අවසාන තීරුවේ ලකුණු ඇතුළත් කරන්න. கீழ் குறிப்பிடப்பட்டிருக்கும் உதாரணத்திற்கு அமைய பல்தேர்வு வினாக்களுக்குரிய புள்ளிகளை பல்தேர்வு வினாப்பத்திரத்தின் இறுதியில் பதிக.

නිවැරදි පිළිතුරු සංඛපාව சரியான விடைகளின் தொகை 25 40

I පතුයේ මුළු ලකුණු பத்திரம் I இன் மொத்தப்புள்ளி 25 40

### Paper II

1. (i)-----[2]

 (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.

Input

: Fingerprint

----- 1 mark

Output

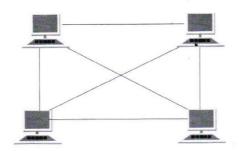
: Monthly Attendance Report

----- 1 mark

(ii) (a) ------[1]

(ii) (a) Draw a diagram to connect four computers namely C<sub>1</sub>, C<sub>2</sub>, C<sub>3</sub> and C<sub>4</sub> based on the *mesh* topology.

[1 mark if all six connections are clearly drawn; Otherwise 0 mark]



141	(base	8	is	not	rea	uired)

Decimal 97

Character

Hexadecimal

61

**Binary** 

1100001

Octal

(iv) (a)[1]
(iv) (a) Draw the logic gate circuit for the following Boolean expression: $F = \overline{C} + A\overline{B}$
Inputs and outputs must be clearly indicated.  (b)[1]
(b) Write down the value of F when $A = 0$ , $B = 1$ and $C = 1$ .
0 (zero)  (v) (a)[1]
<ul> <li>(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.</li> <li>(a) What is the specific software referred to in the above paragraph?</li> </ul>
[ignore case/space defects]
Operating System // OS .  (b)[1]
(b) Give <b>one</b> example for it.
[if more than one answer is given, consider only the first one]

#### Any one from

- Microsoft Windows
- Linux (Ubuntu, CentOS, Fedora, Debian, <u>Red Hat</u> Enterprise Linux, Linux <u>mint</u>, OpenSUSE, Manjaro, Elementary, Zorin, FreeBSD, Hantana Linux, Isuru Linux)
- Unix
- MacOS (OSX)
- Chrome OS
- DOS

(vi) The following table shows some of the icons labelled **△→** of the Audacity audio editing software.

	<b>)</b>	M	
A	B	©	D

Identify the suitable description for each of the icons a-D from the description list numbered 1-6. Write down each icon label and its corresponding description number in **label**  $\longrightarrow$  **number** format.

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

[0.5 marks x 4=2 Marks]

 $A \rightarrow 2$  (Record)

 $B \rightarrow 6$  (Play)

 $C \rightarrow 1$  (Trim Audio)

 $D \rightarrow 4$  (Stop)





(vii) -----[2]

(vii) Match the descriptions labelled ℙ-S 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
P	Used for electronic mail exchange among mail servers on the Internet
<b>©</b>	Provides access to the software installed in the cloud
R	Folder to store mails that are composed to be sent, but not completed yet
S	Used to uniquely identify a computer on the Internet

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

[0.5 marks x 4=2 Marks]

 $P \rightarrow SMTP$ 

 $Q \rightarrow SaaS$ 

 $R \rightarrow Draft$ 

 $S \rightarrow IP Address$ 





17	-	
	171	

(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.

[Ignore spelling/case defects, 2 marks for the correct answer, otherwise 0]

Nirmal and Rajeev

(ix) a)-----[1

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

[One mark per any of the following. If more than one answer is given, consider only the first answer]

Take regular breaks
Blink frequently
Use the right eyeglasses
Maintain a proper (at least 50 cm/20 inches) distance



b)-----[1

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

[One mark per any of the following. If more than one answer is given, consider only the first answer]

Reduce reuse recycle 3 R - Concept



LOI
 7.1

 $(\mathbf{x})$ 

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

[One mark per any of the following. Maximum of two. If more than two answers are given, consider only the first two]

More efficient in retrieving information.
Easy to obtain copies.
Smaller physical space required to store data.
Data analysis can be carried out efficiently.
Data can be shared.



2. (i) Match the descriptions labelled **A**-**D** 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
A	Used to connect two or more computer networks
B	Used in satellite communication to transmit data
©	Used to transmit data using reflection of light
D	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}

[For each correct answer 1 mark]

Λ	_	7	(Router)	
A	_	1	( KOulei	,

 $B \rightarrow 3$  (Microwaves)

C → 2 (Fibre Optics Cable)

D → 1 (Coaxial Cable)







(ii)	[4	.]
------	----	----

- (ii) Consider the following statements labelled ℙ—⑤ 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.
  - P 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.

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

[For each correct answer 1 mark]

P → dpi

 $Q \rightarrow RGB$ 

 $R \rightarrow lossy$ 

S → Raster





(iii) Match the descriptions labelled (8-18) 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							
K	Releasing unsuitable photographs of young girls on the Internet and making use of such images for threatening or blackmailing							
(L)	The act of presenting another's creative work as one's own							
M	The gap between those who have access to Information and Communication Technology (ICT) and those who do not							
N	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}

[For each correct answer 0.5 marks]

 $K \rightarrow 4$  (Cyber crime)

L → 3 (Plagiarism)

Divide

M → 6 (Digital Denied)

 $N \rightarrow 2$  (Phishing)





(a)------[1]

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.

[Exact spelling is required including "\_" sign, ignore case/space defects]

Item ID + Supplier ID // Both Item ID and Supplier ID // Combination of Item ID and Supplier ID //

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

[1 mark x 2 = 2 marks]

[Exact spelling is required including "sign, ignore case/space defects]

Item ID Supplier ID



(ii) (a)	[1]
(ii) Which tables need to be updated	to accommodate the following?
(a) The supplier S004 changes his	s location (Supplier_Location) to Rajagiriya.
	[Exact spelling is required, ignore case defects]
Supplier	$\bowtie$
(b)	[2]
(b) The canteen decides to incre 10 Rupee price increase by the	ease the selling price of a fish roll to 80 Rupees due to a he supplier.
[2 or 0 marks; 2 mark	s if both table names are correct, otherwise 0 marks. Exact spelling is required, ignore case defects]
Item Purchase	
(iii)	[2]
the school canteen for 50 rupees	<b>ID:</b> S008) from Wellawatte starts supplying vegetable rolls to s. Write down the new record(s) to be added to the relevant se the <i>tablename</i> → ( <i>field1</i> , <i>field2</i> ,) format for each new
	[Ignore case and space defects, exact spelling is required]
Supplier → (S008, Kamal, Wella	watte) 1 mark
Purchase $\rightarrow$ (F004, S008, 50)	1 mark
(iv)	[2]
(iv) What are the appropriate tables to who supply fish rolls to the can	be joined to write a query to find the names of the suppliers teen?

[2 or 0 marks; 2 marks if all three table names are correct, otherwise 0 marks. Exact spelling is required, ignore case defects]

Item, Purchase, Supplier (all three tables)

4. (i) (a)		[2	1
i. (i) Use	the following	list of terms in answering questions (a) and (b).	
List		ozilla Firefox, Google, IaaS, HTTP, Pascal, PHP, Twitter, WordPress, Joomsernet Explorer} .	la,
		riptions labelled $\bigcirc -\bigcirc$ with the correct terms from the list of terms give down the relevant term against each label in the <b>label</b> $\rightarrow$ <b>term</b> form	
	Label	Description	
	<b>(A)</b>	Search engine	
	B	Internet service protocol	
	©	Commonly used programming language for dynamic web development	
	D	Social network	
B →1	Google HTTP PHP Twitter	[Jo.5 marks x 4 = 2 marks [Ignore case defects. Exact spelling is required for HTTP and PH]	_
(b)		[2]	,
t	dentify the me erms given ab abel → term	ost suitable term to fill each blank labelled P-S from the list ove and write down the relevant term against each blank label in t format.	of he
		can be developed using a Content Management Systems (CMS) such and	as
	• The publicS	can access a website through a web browser such as	or

[0.5 marks x 4]

## Any one of these

Answer 1	Answer 2	Answer 3	Answer 4
P -> WordPress	P -> Joomla	P -> WordPress	P -> Joomla
Q-> Joomla	Q-> WordPress	Q-> Joomla	Q-> WordPress
R-> Mozilla Firefox	R-> Mozilla Firefox	R-> Internet Explorer	R-> Internet Explorer
S-> Internet Explorer	S-> Internet Explorer	S-> Mozilla Firefox	S-> Mozilla Firefox

(ii) The HTML source of the web page shown in Figure 1 is given in Figure 2 with certain missing tags labelled **1** to **0**.

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}

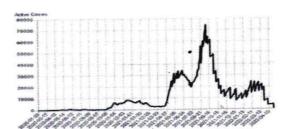
## Sri Lanka's strong vaccination programme assisted in controlling COVID-19

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		77.6%
Second Dose	14,449,321	65.9%
Booster Dose		36.1%

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



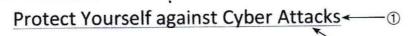
For further information: World Health Organization

```
<html>
<head> < 1> Covid 19 Vaccination in Sri Lanka </1> </head>
<center> <2> Sri Lanka's strong vaccination programme assisted in controlling COVID-19 </2>
   </center>
Sri Lanka has made great progress in controlling the spread of COVID-19; however, the threat is
not over yet.
<3>
  < b border="4" align="center">
   <7>Type of Dose</7>
   <7>Number of Vaccinations</7>
   <7> % of Population </7>
 </0>
  <0>>
   First Dose  17,033,222  77.6% 
  </0>
  <0>>
    Second Dose 14,449,321
                                         65.9% 
  </0>
  <0>>
   Booster Dose 7,959,881
                                       36,1% 
  </10>
</0>
<h3>Monthly Covid 19 active cases in Sri Lanka from 2020 to 2022</h3>
<3> <9 src="active_cases.png" width="400" height="180" alt="Vaccine Photo"> </3>
</13>
>
<a>h3> For further information: < hhref="https://www.who.int/srilanka"> World Health Organization</a>
   </10></h3>
>
</body>
</html>
```

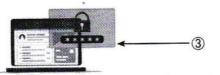
Figure 2: HTML Source

[Exact tag spelling is required. Ignore case defects] 1. title ----- [0.5 marks] ----- [0.5 marks] 2. h2 ----- [0.5 marks] 3. ul ----- [0.5 marks] 4. li 5. table ----- [0.5 marks] ----[0.5 marks] 6. tr ---- [0.5 marks] 7. th 8. center ----- [0.5 marks] ----- [1 mark] 9. img 10. a ----- [1 mark]

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.



You can avoid cyber risks by taking steps in advance:



• 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.

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

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

Icon of the formatting tool	ŧΞ	I	4	9.	A <sup>*</sup>	Picture	Щ	A
Icon label	P	0	®	(S)	T	(Ū)	<b>©</b>	W

Identify the icons of formatting tools, indicated by the labels  $\widehat{\mathbb{P}}-\widehat{\mathbb{W}}$  which are required to do the formatting tasks indicated by the labels  $\widehat{\mathbb{I}}-\widehat{\mathbb{S}}$ . Write down the label of each formatting task  $\widehat{\mathbb{I}}-\widehat{\mathbb{S}}$  and its matching icon label of the formatting tool in the **task label**  $\longrightarrow$  **icon label** format.

## [ALL 5 CORRECT- 4 MARKS, 3-4 CORRECT-3 MARKS, 2 CORRECT-2 MARKS, 1 CORRCT- 1 MARK]

[Ignore case defects]

 $1 \rightarrow T$  $2 \rightarrow V$ 

 $3 \rightarrow U$ 

4→ P

 $5 \rightarrow S$ 





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

â	A	В	С	D	E
1	Accid	ent Data fo	r Year 20:	18	
2			Type of A	ccident	
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		All has been deed to be a second	and the state of t		

(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.

[Exact spelling is required, parentheses needed, ignore case/space defects]
=SUM(B4:B11)

(b) -----[1]

(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.

[Exact spelling is required, parentheses needed, ignore case/space defects] =SUM(D4:D11)

(c) -----[1]

(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.

[Exact spelling is required, parentheses needed, ignore case/space defects]

=MIN(D4:D11)

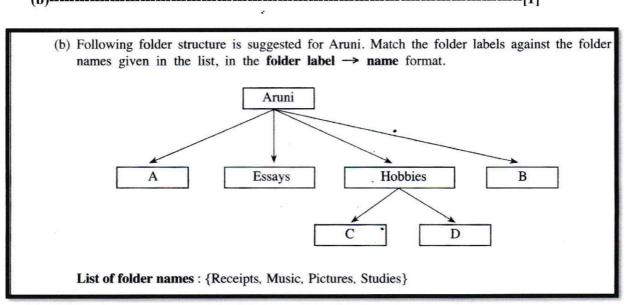
[1]
range in the form of (cell5;cell6) for the formula written est number of any accident.
yith correct cell range as =MAX(B44:E11) give marks]
(E11:B4)
[1]
art type available in spreadsheet software from the given the types of accidents involving each vehicle type in the {Area, Bar, Pie, Scatter}
[Exact spelling is required, ignore case/space defects]
[2[1]
al accidents for each vehicle type.
: {Area, Line, Pie, Scatter}
[Exact spelling is required, ignore case/space defects]

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.

Difficulty in finding files // time consuming to find files [1]



[1 or 0 marks only; ignore spelling/case/space defects]

Answer 1	Answer 2	Answer 3	Answer 4
A → Studies	A → Receipts	A → Studies	A → Receipts
B → Receipts	B → Studies	B → Receipts	B → Studies
C → Music	C → Music	$C \rightarrow Pictures$	$C \rightarrow Pictures$
D → Pictures	D → Pictures	D → Music	D → Music

(c)	[1]
	(c) Write one practice Aruni can follow to avoid her hard disk becoming full.
7000000000	[if more than one answer is given, consider only the first one]
	Any one from  - periodically remove all unwanted files  - install only the necessary software  - remove all unwanted/unused software  - move files to other storage devices  - store compressed files (e.g., mp3)  - Use the disk cleanup tool  - Save to cloud  - discard temporary files  - do not download files unnecessarily  - eliminate duplicate files
(d)	[1]
	(d) Write one practice that Aruni could have followed to avoid losing data in the event of a computer failure.
	[if more than one answer is given, consider only the first one]
cloud	taking periodic <u>backups</u> // copying files to other storage media // saving files in the
(ii) (a)	[1]
(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?

Iterative incremental // prototyping //spiral

(b)[1]
(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?
Acceptance testing
(c)[1]
(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?
<u>Direct</u> Deployment
(d)[1]
(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 methol suggested by the development team?
Pilot deployment
(iii)[2]
(iii) A school library is planning to introduce a computerized library management system to replace the existing manual system. List <b>two</b> techniques that could be used for requirement identification.
[1 marks x 2 = 2 marks] [if more than two answers are written, consider only the first two]
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7. (i) (a) -----[2]

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
```

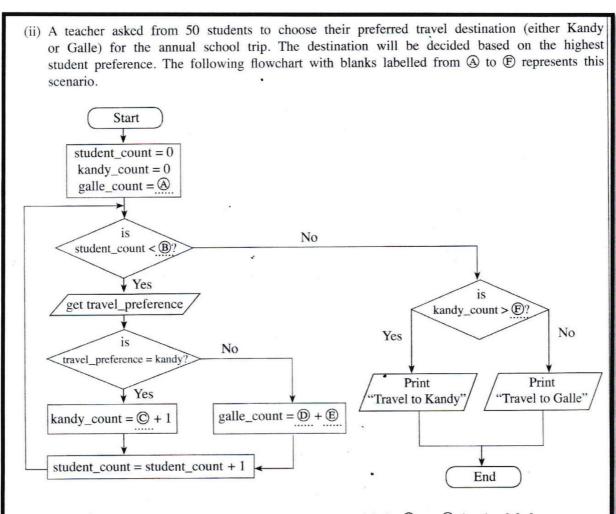
(a) What is the exact purpose of the above pseudocode?

Read 20 numbers and find/display their total

(b) -----[2]

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

Infinite loop // program will not terminate // continuously asking to input a number and reading it (logical error is also acceptable)



Write down the appropriate answers to match the labels A to F in the label  $\longrightarrow$  answer format.

[Exact spelling (including "\_") is required. Ignore space/case defects]

Answer 1	Answer 2	
A: 0	A: 0	
B: 50	B: 50	
C: kandy count	C: kandy count	
D: galle count	D: 1	
E: 1	E: galle count	
F: galle count	F: galle count	