G.C.E. (O/L) Examination - 2019

80 - Information and Communication Technology

Calculating final marks

Paper I - 40 marks

Paper II - 60 marks

Final marks - 100 marks

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Common Techniques of Marking Answer Scripts.

It is compulsory to adhere to the following standard method in marking answer scripts and

entering marks into the mark sheets.

1. Use a red color ball point pen for marking. (Only Chief/Additional Chief Examiner may use a mauve color pen.)
2. Note down Examiner's Code Number and initials on the front page of each answer script.
3. Write off any numerals written wrong with a clear single line and authenticate the alterations with Examiner's initials.
4. Write down marks of each subsection in a △ and write the final marks of each question as a rational number in a □ with the question number. Use the column assigned for Examiners to write down marks.

Example: **Question No. 03**

(i) ……..... √ △ $\frac{4}{5}$

(ii) ……..... √ △ $\frac{3}{5}$

(iii) ……..... √ △ $\frac{3}{5}$

03 (i) $\frac{4}{5}$ + (ii) $\frac{3}{5}$ + (iii) $\frac{3}{5}$ = □ $\frac{10}{15}$

MCQ answer scripts: (Template)

1. Mark the correct options on the template according to the Marking Scheme. Cut off the marked windows with a blade. Cut off the cages for Index Number and the number of correct options so as to be able to keep the template correctly on the answer script. Cut off a blank space to the right of each options column to mark the answers. Submit the prepared template to the Chief Examiner for approval.
2. Then, check the answer scripts carefully. If there are more than one or no answers marked to a certain question write off the options with a line. Sometimes candidates may have erased an option marked previously and selected another option. In such occasions, if the erasure is not clear write off those options too.
3. Place the template on the answer script correctly. Mark the right answers with a '√' and the wrong answers with a 'X' against the options column. Write down the number of correct answers inside the cage given under each column. Then, add those numbers and write the number of correct answers in the relevant cage.

Structured essay type and assay type answer scripts:

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1. Cross off any pages left blank by candidates. Underline wrong or unsuitable answers. Show areas where marks can be offered with check marks.

2. Use the right margin of the overland paper to write down the marks.

3. Write down the marks given for each question against the question number in the relevant cage on the front page in two digits. Selection of questions should be in accordance with the instructions given in the question paper. Mark all answers and transfer the marks to the front page, and write off answers with lower marks if extra questions have been answered against instructions.

4. Add the total carefully and write in the relevant cage on the front page. Turn pages of answer script and add all the marks given for all answers again. Check whether that total tallies with the total marks written on the front page.

Preparation Of Mark Sheets.

Except for the subjects with a single question paper, final marks of two papers will not be calculated within the evaluation board. Therefore add separate mark sheets for each of the question paper. Enter paper I marks in "Total Marks" column of the mark sheet and write them in words as well. Enter paper II Marks in the " Total Marks" Column and include the relevant details. For the subject 43 Art, marks for Papers I,II and III should be entered numerically in the mark sheets.

For subjects 21 Sinhala language and literature and 22 Tamil Language and literature, paper I marks once entered numerically should be written in words. For the papers II and III enter the detailed marks separately and put the total in each paper in the relevant column.

Final marks for paper I, paper II or paper III should always be rounded up to the nearest whole number and they should never be kept as decimal or half values.

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Information and Communication Technology

MARK SCHEME

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Paper II	**2**	22
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	7	28

Instructions:

1. Acceptable alternatives for a given word or set of words are separated by slashes (/).
2. Alternative answers are separated by double slashes (//).
3. Marks should **not** be given for a question if **more** than the required number of answers are written by the student.
4. ✓ indicates to consider as correct if the student's intention is correct.
5. ⇦ indicates that any credit for this should be given only if A is correct

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සියලු ම හිමිකම් ඇවිරිණි / முழுப் பதிப்புரிமையுடையது / All Rights Reserved]

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
இலங்கைப் பரீட்சைத் திணைக்களம்
Department of Examinations, Sri Lanka

80 | E | I, II

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2019 දෙසැම්බර්
கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2019 டிசெம்பர்
General Certificate of Education (Ord. Level) Examination, December 2019

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

06.12.2019 / 0830 - 1140

පැය තුනයි
மூன்று மணித்தியாலம்
Three hours

අමතර කියවීම් කාලය - මිනිත්තු 10 යි
மேலதிக வாசிப்பு நேரம் - 10 நிமிடங்கள்
Additional Reading Time - 10 minutes

Use **additional reading time** to go through the question paper, select the questions and decide on the questions that you give priority in answering.

Information & Communication Technology I

Note :

- *Answer **all** questions.*
- *In each of the questions **1** to **40**, pick one of the alternatives* (1), (2), (3), (4) *which is **correct** or **most appropriate**.*
- ***Mark a cross** (×) **on the number corresponding to your choice in the answer sheet provided.***
- *Further instructions are given on the back of the answer sheet. Follow them carefully.*

1. Which of the following devices have both *input* and *output* capabilities?
(1) joystick (2) OCR Device (3) touch screen (4) webcam

2. Which of the following can be a good practice to protect data and information from computer hard disk failures?
(1) installing a firewall (2) installing an antivirus software
(3) taking periodic backups (4) using a strong password

3. Which of the following is correct regarding the generations of computers?
(1) Integrated Circuits (ICs) were introduced in 1st generation computers.
(2) Vacuum tubes were introduced in 2nd generation computers.
(3) Transistors were introduced in 3rd generation computers.
(4) Very Large Scale Integrated Circuits (VLSI) were introduced in 4th generation computers.

4. Which of the following are related to G2C (Government to Citizen) services in Sri Lanka?
A - viewing G.C.E. (O/L) results online
B - ordering food items online
C - renewing vehicle revenue licenses online
(1) A only (2) A and C only (3) B and C only (4) all A, B and C

5. Which of the following is an example for *data processing*?
(1) calculating the account balance using banking software after a cash withdrawal
(2) copying a file from a USB drive to a hard disk of a computer
(3) installing sound editing software in a personal computer
(4) scanning a letter using a scanner

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6. Select the most suitable computer type from a *super computer*, a *laptop computer* and a *tablet computer*, for the following applications:

A - to process very large amounts of data that are continuously obtained through satellites
B - for a writer to work on an essay during a vacation away from home
C - for a travelling sales representative to enter item requests while visiting shops

(1) A: laptop computer, B: super computer, C: tablet computer
(2) A: laptop computer, B: tablet computer, C: super computer
(3) A: super computer, B: laptop computer, C: tablet computer
(4) A: tablet computer, B: super computer, C: laptop computer

7. Consider the following statement with blanks labelled Ⓐ and Ⓑ:

When processing, the CPU uses its .....Ⓐ..... to temporarily store data that are brought from .....Ⓑ..... .

Which of the following combinations is suitable to fill the blanks labelled Ⓐ and Ⓑ respectively?
(1) primary memory, registers
(2) registers, primary memory
(3) secondary memory, primary memory
(4) secondary memory, registers

8. Which of the following are correct regarding transmission media?

A - Unshielded Twisted Pair (UTP) cables are suitable to transmit data for long distances over 200 m.
B - Fiber optic cables transmit data faster than UTP cables.
C - Infrared data transmission is used in wireless keyboards to communicate with computers.

(1) B only (2) C only (3) B and C only (4) all A, B and C

9. Which of the following statements are true?

A - Binary form is used to store data and instructions in computers.
B - 945 is a valid number both in the octal and hexadecimal number systems.
C - 412_8 is equivalent to 100001010_2.

(1) A only (2) B only (3) A and C only (4) all A, B and C

10. Which of the following shows the given storage components in descending order of *access speed*?
(1) cache memory, main memory, register, hard disk
(2) hard disk, cache memory, register, main memory
(3) register, cache memory, main memory, hard disk
(4) register, main memory, hard disk, cache memory

11. If character 'E' is represented in the ASCII table as 69_{10}, what is the binary representation of character 'G' in the ASCII table?
(1) 1000110 (2) 1000111 (3) 1001000 (4) 1001001

12. Which of the following contains only the tasks of an operating system?
(1) payroll management, process management, file management
(2) process management, database management, file management
(3) process management, memory management, database management
(4) process management, memory management, file management

13. Which of the following techniques can be used to increase the free space of a hard disk without deleting any existing files?
(1) compression of existing files on the hard disk
(2) copying some files in the hard disk to a flash drive
(3) formatting of the hard disk
(4) partitioning of the hard disk

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14. While editing a document using a word processing software, you decide to copy a selected part of the document to another document. Which of the following key combinations will enable you to carry out this task?

(1) Ctrl + C followed by Ctrl + V
(2) Ctrl + N followed by Ctrl + V
(3) Ctrl + P followed by Ctrl + V
(4) Ctrl + V followed by Ctrl + C

15. Consider the range of cells given as (A3:C4) in a spreadsheet. Which of the following cells are included in this range?

(1) A3 and C4 only
(2) A3, B3 and C3 only
(3) A3, A4, C3 and C4 only
(4) A3, B3, C3, A4, B4 and C4 only

16. Consider the following spreadsheet segment with the formula =B2 * B$5 written into cell C2:

	A	B	C
1	Name	Sales (Rs)	Commission (Rs)
2	A. Dias	50000	5000
3	B. Sivarajah	60000	
4			
5	Percentage:	0.1	
6			

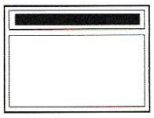
What would be displayed in the cell C3 if the formula in cell C2 was copied to cell C3?

(1) 0 (2) 5000 (3) 6000 (4) 60000

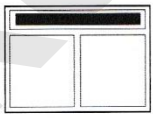
17. You want to add a blank slide to an electronic presentation that you are editing. Which of the following key combinations can be used for this purpose?

(1) Ctrl+M (2) Ctrl+N (3) Shift+B (4) Shift+V

18. Which of the following features of electronic presentation software can be used to change the content arrangement of a slide from *Arrangement 1* to *Arrangement 2*?



Arrangement 1



Arrangement 2

(1) Slide layout (2) Slide show (3) Slide sorter (4) Slide view

19. Which of the following is **not** a common feature of both word processing and electronic presentation software?

(1) changing line space
(2) find and replace
(3) mail merge
(4) spell checker

20. Which of the following is suitable in order to improve the quality of an electronic presentation?

A - limiting the number of text lines on a slide to between 6 and 9
B - not having a large number of pictures and graphs on a single slide
C - using a lot of red colour on every slide

(1) A and B only (2) A and C only (3) B and C only (4) all A, B and C

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- Questions **21** to **24** are based on the following partly shown database tables that are used to store data about books, students, and books reserved by students in a school library.

Table: Book (Contains the details of books and whether each book is reserved or not.)

Book_ID	Title	Reserved
B0001	Effective Writing	TRUE
B0002	Classic Short Stories	TRUE
B0003	Poem Writing	FALSE
B0004	Vocal Theory	TRUE

Table: Student (Contains details of all students in school and whether each student is a library member or not.)

Student_Name	Student_ID	Grade	Library_Member
Piyal	1001	7	TRUE
Kumar	1002	9	TRUE
Ismail	1003	8	TRUE
Sunil	1004	10	FALSE
Sarath	1005	7	TRUE

Table: Reservation (Contains details about books reserved by students.)

Student_ID	Reserved_Date	Book_ID
1003	02/03/2019	B0002
1002	23/04/2019	B0001
1005	16/06/2019	B0004

21. How many *fields* are in the *Student* table?
(1) 2 (2) 3 (3) 4 (4) 5

22. What would be an example of a *foreign key* in the database?
(1) **Book_ID** in *Reservation* table (2) **Grade** in *Student* table
(3) **Reserved_Date** in *Reservation* table (4) **Title** in *Book* table

23. What is the title of the book reserved by Kumar?
(1) Classic Short Stories (2) Effective Writing
(3) Poem Writing (4) Vocal Theory

24. A student gets the library membership and reserves a book. What tables need to be updated for this purpose?
(1) *Book* table and *Reservation* table
(2) *Book* table and *Student* table
(3) *Reservation* table and *Student* table
(4) *Book* table, *Reservation* table and *Student* table

25. Which of the following shows the correct order of testing a software system?
(1) acceptance testing, integration testing, unit testing, system testing
(2) system testing, integration testing, acceptance testing, unit testing
(3) unit testing, acceptance testing, system testing, integration testing
(4) unit testing, integration testing, system testing, acceptance testing

26. Every web page on the World Wide Web (WWW) has a unique identifier called the
(1) *email address*. (2) *hyperlink*. (3) *IP address*. (4) *URL*.

27. Which of the following combinations contains only Internet related protocols?
(1) FTP, HTML, HTTP, SMTP (2) FTP, HTML, HTTP, TCP/IP
(3) FTP, HTTP, SMTP, TCP/IP (4) HTML, SMTP, TCP/IP, URL

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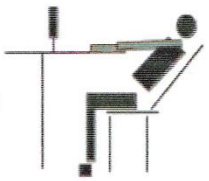
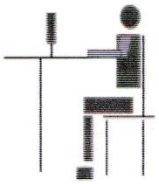
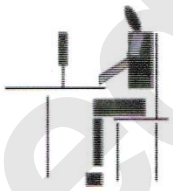
28. Which of the following combinations represents only the services of the Internet?
(1) email, file sharing, remote access, streaming of media
(2) email, file sharing, streaming of media, web browsers
(3) file sharing, HTML codes, remote access, search engines
(4) remote access, search engines, streaming of media, web browsers

29. Consider the following list rendered by a web browser:
- Science
- Maths
- English

Which of the following HTML tags are required to create the above list?
(1) <dl>,<dt> (2) <dl>, (3) , (4) ,

30. Which of the following statements related to web page development are correct?
A - The content shown in dynamic web pages may vary according to user inputs or time.
B - Dynamic web pages are created only using HTML.
C - Web authoring tools can be used to create web pages.
(1) A and B only (2) A and C only (3) B and C only (4) all A, B and C

31. Which of the following tags can be used for HTML character formatting?
(1) <i>, <b>, <u>, (2)
, <b>, <u>, <p>
(3) <p>, <li>, <u>, (4) <i>, <b>, <li>,

32. Which of the following is the correct posture to use when using a computer?
(1)  (2)  (3)  (4) 

33. How many bits per pixel (bpp) are required to represent 32 colours?
(1) 4 (2) 5 (3) 6 (4) 7

34. What would happen to an image if its *resolution* is **decreased**?
(1) quality and the file size of the image increases
(2) quality and the file size of the image decreases
(3) quality increases while the file size of the image decreases
(4) quality decreases while the file size of the image increases

35. Which of the following statements are true?
A - Pascal is an example of a high-level programming language.
B - High-level language programs are easier for the programmers to understand than low-level language programs.
C - A compiler translates a high-level language program into machine language instructions.
(1) A and B only (2) A and C only (3) B and C only (4) all A, B and C

36. Consider the following pseudo-code segment:

```
BEGIN
    READ units
    IF units <=50  THEN
        amount=units*1
    ELSE
        IF  units>50 AND units <= 150 THEN
            amount=50 + (units - 50)*2
        ELSE
            amount = 250 + (units - 150)*5
        ENDIF
    ENDIF
    DISPLAY amount
END
```

What would be the output if the value 175 is input for the variable *units*?
(1) 175 (2) 250 (3) 300 (4) 375

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37. What would be the output if a user inputs the numbers 4, 5, 2, –1 one after the other for the following pseudo-code segment?

```
terminal = –1
x = 0
REPEAT
    DISPLAY "Enter number"
    GET num
        IF num > x THEN
            x = num
        ENDIF
UNTIL num = terminal
DISPLAY x
```

(1) –1 (2) 0 (3) 4 (4) 5

38. Consider the following statements regarding *computer programs*:

A - *Variables* can contain different values at different times.

B - *Reserved words* of a programming language can be used as *variable names* in that language.

Which of the following is true with respect to the above?

(1) Only A is correct. (2) Only B is correct.

(3) Both A and B are correct. (4) Both A and B are incorrect.

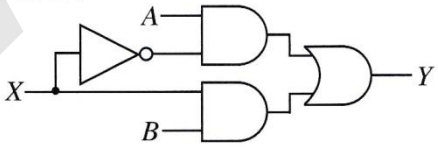
39. Consider the following pseudo-code:

```
READ a, b, c
value = 0
IF (a>b) THEN
        IF (a>c) THEN
            value = a
        ELSE
            value = c
        ENDIF
ENDIF
DISPLAY value
```

If the values input for the variables a, b and c are 50, 30 and 70 respectively, what would be the displayed output?

(1) 0 (2) 30 (3) 50 (4) 70

40. If 0 and 1 respectively are given as inputs for X in the following logic circuit, what would be the two respective outputs at Y?



(1) $A, \overline{B}$ (2) A, B (3) $B, \overline{A}$ (4) B, A

* *

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ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
இலங்கைப் பரீட்சைத் திணைக்களம்
අ.පො.ස.(සා.පෙළ) විභාගය - 2019
க.பொ.த (சா.தர)ப் பரீட்சை - 2019

විෂයය අංකය
பாட இலக்கம்
பாடம் **80** විෂයය **Information and Communication Technology**

I පත්‍රය - පිළිතුරු
Iபத்திரம் - விடைகள்

ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.
01.	03	11.	02	21.	03	31.	01
02.	03	12.	04	22.	01	32.	02
03.	04	13.	01	23.	02	33.	02
04.	02	14.	01	24.	04	34.	02
05.	01	15.	04	25.	04	35.	04
06.	03	16.	03	26.	04	36.	04
07.	02	17.	01	27.	03	37.	04
08.	03	18.	01	28.	01	38.	01
09.	03	19.	03	29.	04	39.	04
10.	03	20.	01	30.	02	40.	02

විශේෂ උපදෙස් විසේட அறிவுறுத்தல்
එක් පිළිතුරකට ලකුණු ஒரு சரியான விடைக்கு
බැගින් புள்ளி வீதம் **01**

මුළු ලකුණු/ மொத்தப் புள்ளிகள் **01×40= 40**

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

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සියලු ම හිමිකම් ඇවිරිණි / முழுப் பதிப்புரிமையுடையது / All Rights Reserved]

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
இலங்கைப் பரீட்சைத் திணைக்களம்
Department of Examinations, Sri Lanka

80 | E | I, II

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2019 දෙසැම්බර්
கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2019 டிசெம்பர்
General Certificate of Education (Ord. Level) Examination, December 2019

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 Colombo Weather Centre records daily rainfall values for one month.
Write down **two** examples for *information* that can be found by *processing* the above mentioned daily rainfall *data*.

(ii) Consider the following diagram with images of some computer ports labelled Ⓐ – Ⓔ.

Image of the port					
Label	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ

Identify the name of each port using the list given below. Write down the label of each port and its matching port name.

List : {*Audio, HDMI, RJ45, USB, VGA*}

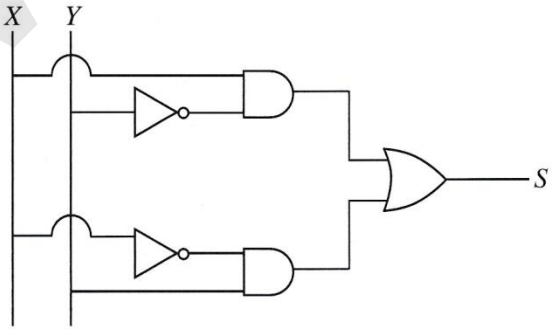
(iii) (a) Convert 1260_{10} to its octal equivalent.
(b) Convert $A1_{16}$ to its binary equivalent.

(iv) (a) Consider the following logic gate.



Draw the truth table (having two columns as *A* and *P*) for the above gate.

(b) Consider the following logic circuit.



Write down the relevant boolean expression for *S*.

[see page eight

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2. (i) Some information technology related risks (labelled Ⓐ – Ⓓ) are given below.

Ⓐ losing user files and folders due to a hard disk failure

Ⓑ computer behaving abnormally after the use of a flash drive

Ⓒ data in a computer connected to the Internet accessed remotely without authorization

Ⓓ frequent power supply interruptions to a personal computer

Identify suitable solutions for the above risks from the labelled list (Ⓟ – Ⓤ) given below. Write down the risk label and the matching solution label.

List : {Ⓟ - *getting regular backups,* Ⓠ - *installing CCTV,* Ⓡ - *installing firewalls,*
Ⓢ - *use of surge protectors,* Ⓣ - *use of UPS,* Ⓤ - *use of anti-virus software*}

(ii) The 3R (**R**educe, **R**euse and **R**ecycle) technique is well accepted for waste reduction. Explain this technique with respect to reducing e-waste.

(iii) Write answers for the following:

(a) Write one way in which a person can protect a spreadsheet on his computer from unauthorized access. (Assume that the computer is not connected to the Internet.)

(b) A person cannot afford to buy commercial spreadsheet software for his computer. He has to use spreadsheet software often and he does not like the expense and the inconvenience of going to an ICT center each time for it. Suggest one thing that he could do fulfill his spreadsheet requirements.

(c) To facilitate student learning, a school principal wants to start a Learning Management System (LMS) in her school using an unused, new computer. Write down one benefit that students can obtain through this LMS.

(d) Explain how a student can include in his essay without plagiarizing, a part of the content of a website.

(e) A manager in a Colombo office wants to have a meeting with managers in Jaffna and Matara offices using a video conference. Write down the requirements that are needed in these locations in order to use this facility.

(iv) An office wants to create a computer network using a *hub*, three computers (named *server*, *computer A*, *computer B*) and a *printer* using a *star topology*.

Using named boxes for the devices (e.g., [hub]), draw a diagram to illustrate the above topology for the office.

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3. Following are the partly shown tables of the relational database of a sports team management system in a school.

PlayerID	FirstName	LastName	StudentID
P1001	Saman	Perera	S1538
P1002	Raj	Selvam	S1201
P1003	Sharaf	Nazwar	S2735
P1004	Saman	Silva	S1465
P1005	Shane	Almaida	S2905
P1006	Nimal	Fernando	S1350
:			
:			

Table: Player (Includes the descriptions of players)

TeamID	PlayerID	YearJoined
T1	P1002	2013
T1	P1004	2014
T2	P1003	2015
T2	P1005	2015
T3	P1001	2014
T3	P1006	2013
:		
:		

Table: Player_Team
(Contains the players of each team and their years of joining)

TeamID	TeamName	AgeGroup	CaptainID
T1	Cricket	U19	P1002
T2	Cricket	U17	P1003
T3	Volleyball	U19	P1002
T4	Volleyball	U17	P1004
:			
:			

Table: Team
(Contains the names and age categories of teams and their captains)

(Note: **CaptainID** is a valid **PlayerID**)

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

(b) Write down the possible primary keys available in the **Player** table.

(ii) Which table(s) need(s) to be updated to accommodate the following changes?

(a) A new student, *Piyal Alwis* (**StudentID**: *S4205*), is admitted to the school and joins the *U17 Cricket* team in *2019*.

(b) *Nimal Fernando* is appointed the captain of the *U19 Volleyball* team.

(iii) (a) Write down the new record(s) to be added to the relevant table(s) for the change mentioned in part (ii) (a). Use the format: *tablename* → (*field1, field2, …*) for each record.
(Note: Assume that *Piyal Alwis* is assigned the **PlayerID** *P1120*)

(b) In 2019, the school starts an Under 17 (*U17*) *Football* team (**TeamID**: *T7*) and appoints *Shane Almaida* as the captain. Write down the new record(s) to be added to the relevant table(s) for the above change. Use the format: *tablename* → (*field1, field2, …*) for each record.
(Note that *Shane Almaida* is currently playing in the *U17 Cricket* team.)

(iv) Which tables are to be joined to write a query to find the name of the *U19 Cricket* captain?

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4. (i) Consider the following statements with blanks labelled Ⓐ–Ⓕ. Identify the most suitable term to fill each blank from the list given below. Write down the statement label and the matching term.

Ⓐ - ..... determines the correspondence between domain names and IP addresses on the Internet.

Ⓑ - ..... is used to transfer large files from one computer to another over the Internet.

Ⓒ - ..... is one of the most important protocols for email transport between email servers.

Ⓓ - ..... is the top level domain of the domain name *www.nie.lk*.

Ⓔ - ..... could be used to find out web pages whose URLs are not known.

Ⓕ - ..... separates the user name and domain name of an email address.

List : {*# symbol, @ symbol, DNS service, FTP, HTTP, ICMP, IP address, IP service, lk, nie.lk, Search engines, SMTP, URL*}

(ii) Choosing from the examples given in the list, write down the correct example for each of the labelled items Ⓐ to Ⓓ given below. You are only required to write the label and the corresponding example.

Ⓐ - web browser

Ⓑ - programming language for dynamic web content creation

Ⓒ - web authoring tool

Ⓓ - content management system

List : {*Joomla, Kompozer, Mozilla Firefox, Pascal, PHP*}

(iii) The HTML source of the web page shown in **Figure 1** is given in **Figure 2** with certain missing tags labelled ① to ⑩.

Dengue fever: What is it and how to stop it?



STOP DENGUE

Stop Dengue!

Dengue fever is a mosquito borne viral infection that causes a flu-like illness.

It can worsen into severe dengue and become deadly if not treated well.

Currently about one-third of the world's population is at risk of contracting dengue fever.

Dengue fever signs, symptoms	Five prevention tips
• High fever • Swollen lymph glands • Muscle, joint and abdominal pains • Nose bleeding • Excessive vomiting	1. Eliminate standing water 2. Use good mosquito repellent 3. Clean and monitor gradens well 4. Wear protective clothing 5. Use Guppi fish in ponds

For more information: Dengue prevention

Figure 1: The web page

[see page thirteen

5. Consider the following spreadsheet segment which consists of marks obtained by 40 students in a class for their three subjects at a school term test. Students' marks for Subject 1, Subject 2 and Subject 3 are shown in columns C, D and E respectively. This spreadsheet is used to compute the Z-score for each subject of each student and the final Z-score for each student.

	A	B	C	D	E	F	G	H	I
1	Index	Student	Marks			Z-Score			Final
2	No.	Name	Subject 1	Subject 2	Subject 3	Subject 1	Subject 2	Subject 3	Z-score
3	1	Kamal	27	34	43	-1.1081	-1.0146	-0.4915	-0.8714
4	2	Raju	45	50	62	0.0382	0.0879	0.8284	0.3182
5	3	Rauf	34	40	60	-0.6623	-0.6012	0.6895	-0.1913
6	4	Krishna	66	70	70	1.3756	1.4660	1.3842	1.4086
....									
41	39	Roshan	84	73	85	2.3565	1.6417	2.1601	2.0528
42	40	Khan	40	60	50	-0.2936	0.7580	-0.0767	0.1292
43	Average marks of the subject		44.8750	44.8500	51.2000				
44	SD value of the subject		16.6027	14.7101	15.6471		Highest Z-score		2.0528
45									
46									

(i) Write down the formula that should be entered in cell C43 to calculate the average mark for Subject 1 in the form of *=function1(cell1:cell2)*

(ii) If this formula is copied to cells D43 and E43, write down the formula that will appear in cell D43.

(iii) The Z-score for a subject of a student can be calculated by using the following formula:

Z-score = (student's marks for the subject – average marks for the subject) / SD value of the subject

The SD values required for each subject are given in cells C44, D44 and E44 respectively.

(a) Write down the formula that should be entered to cell F3 to calculate Kamal's Z-score for Subject 1.

Note that this formula is to be copied to calculate the Z-scores for Subject 1 of all other students too.

(b) If this formula is copied to cell range F4 to F42, write down the formula that will appear in cell F42 which shows Khan's Z-score for Subject 1.

(iv) The final Z-score of a student is the average of the three Z-scores for the subjects. Write down the formula to calculate the final Z-score value of Kamal in cell I3 using **only** the functions **COUNT** and **SUM**.

(v) Assuming that student Z-score values for the three subjects and the final Z-score for all students have been calculated, write down a formula that should be entered in cell I44 to find the highest final Z-score value in the form of *=function2(cell3:cell4)*.

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6. (i) Following table shows five stages of the systems development life cycle (SDLC) with an activity for each stage.

Stage of SDLC	Activity
Identification of requirements	Ⓐ
Ⓑ	Designing interfaces
Ⓒ	Writing the computer programs
Testing and debugging	Ⓓ
Ⓔ	Adding new features to the system

Identify the suitable choice for each of the labels Ⓐ – Ⓔ from the labelled list (Ⓟ – Ⓣ) given below. Write down each label in the table and its matching choice label.

List : {Ⓟ - *Coding the solution,* Ⓠ - *Designing the solution,* Ⓡ - *Integration testing,* Ⓢ - *Interviewing,* Ⓣ - *Maintenance of the system*}

(ii) The book shop in your school operates with a computer-based information system. When a student goes to buy stationery, the clerk enters the item code and the quantity of each item the student wants to buy. The system then calculates the total cost for each item and the total bill value. Then the system displays the final bill on the screen and prints it.

Using the above scenario answer the following questions.

(a) Write down one *input*.

(b) Write down one *process*.

(c) Write down one *output*.

(iii) Identify the correct term from the given labelled list (Ⓟ – Ⓣ) for each of the following scenarios labelled Ⓐ – Ⓓ. Write down the scenario label and the matching term label.

Ⓐ - Sunil is developing a library management system and told the teacher that she will not be able to use any part of the system until the entire system is fully developed.

Ⓑ - After completion of a small information system for the school canteen, Azma decided to stop the existing system and operate the new system.

Ⓒ - After monitoring the new student information system initially introduced to Grade 6 classes, the Principal plans to introduce the system to the other classes of the school.

Ⓓ - The initial system was developed with two input screens and one report. Based on the user feedback two more input screens and reports were added to the system. More features are to be added based on further user feedback.

List : {Ⓟ - *direct deployment,* Ⓠ - *iterative software development,* Ⓡ - *phased deployment,* Ⓢ - *pilot deployment,* Ⓣ - *waterfall model*}

(iv) List **two** benefits of a computer-based information system over a manual information system.

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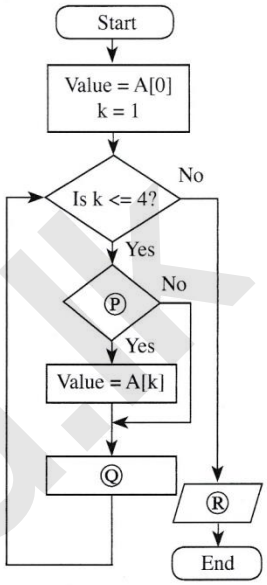
7. (i) Consider the following array **A** containing five integer values.

A[0]	A[1]	A[2]	A[3]	A[4]
80	100	70	65	95

(a) Write the output of the following pseudo-code when it is executed on the above array **A**.

```
BEGIN
   Value = A[0]
   k = 1
   WHILE (k<=4)
         IF A[k] < Value THEN
            Value = A[k]
         ENDIF
         k=k+1
   ENDWHILE
   DISPLAY Value
END
```

(b) Identify and write down the correct statements for Ⓟ, Ⓠ and Ⓡ in the flowchart on the right which is drawn using the above pseudo-code.

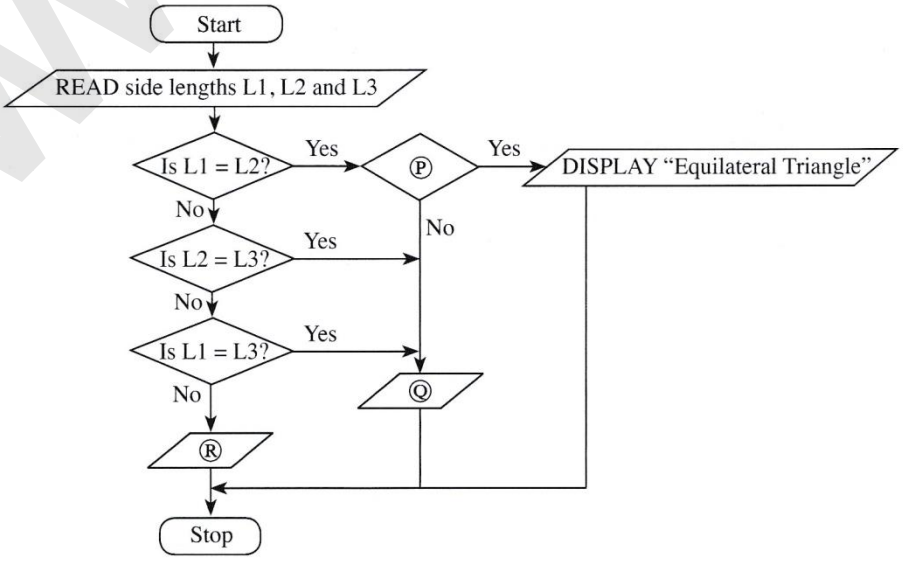


(c) Redraw the array **A** and its contents after the following assignments are carried out on the array **A**.

A[1] = 45
A[2] = 88
A[4] = 72

(ii) A triangle with all three sides of equal length is called an **equilateral** triangle. A triangle with two sides of equal length is called an **isosceles** triangle. A triangle with all sides of different lengths is called a **scalene** triangle.

The following flowchart with labels Ⓟ, Ⓠ, Ⓡ determines if a given triangle is an equilateral, isosceles or a scalene triangle.



Write down the relevant statements for the labels Ⓟ, Ⓠ and Ⓡ.

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Paper II (compulsory question)

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

Two examples for information

One mark per any of the following. **Maximum of two** of them.

- average rainfall
- maximum rainfall
- minimum rainfall
- mode of the rainfall
- median of the rainfall
- rainfall variation // no. of rainy days // no. of continuous rainy days
- rainfall predictions for future
- total rainfall

(ii)----------[2]

Port label to port name match

Two marks for **4-5** correct, **one mark** for **1-3** correct. **Exact spelling** important for B, C, D and E.

A – Audio ✓ , B – RJ45, C – HDMI, D – USB, E - VGA

(iii) **(a)----------[1]**

Convert 1260_{10} to its octal equivalent

2354_8 // 2354

(b)----------[1]

Convert $A1_{16}$ to its binary equivalent

$1010\ 0001_2$ // 1010 0001

(iv) **(a)** **----------[1]**

Draw a truth table with two columns A and P

A	P
0	1
1	0

(b)----------[1]

Boolean expression for S

The dot is not compulsory.

S = X.Y' + X'.Y // $S = X.\overline{Y} + \overline{X}.Y$

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(v)----------[2]

Write down folder names

Two marks for **4-5** correct, **one mark** for **1-3** correct.

A – Studies, B – Science ⇦ , C – Music, D – Photos, E – 2019 ⇦ ✓

(vi)----------[2]

Formatting task to tool icon matching

Two marks for **3-4** correct, **one mark** for **1-2** correct.

A – Q, B – S, C – P, D - U ✓

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

Which two fields make the primary key?

Exact spelling important. Ignore case and space defects.

Month SalesRepID

(b)----------[1]

Most suitable data types for Month and TotalSales fields?

✓

Month: Text TotalSales: Currency

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(viii)----------[2]

Match P, Q,R,S in the flowchart to statement numbers

Two marks for **3-4** correct, **one mark** for **1-2** correct.

P – 1, Q – 4, R – 3 ⇦ , S – 2 ⇦

If the student had written down the statements, then to be considered as correct, each correctly selected statement must be exactly written as in the question.

(ix)----------[2]

Select proper word for blank

Two marks for **3-4** correct, **one mark** for **1-2** correct.

A - pixel, B – vector, C – Lossy, D – GIF ✓

(x)----------[2]

A - Can Gihan see Hameed is a recipient? B – Can Sharma see Gihan as a recipient?

One mark per each

A – T, B – F ✓

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

Match risks to solutions

One mark for **3-4** correct.

A – P, B – U, C – R, D - T ✓

(ii)----------[2]

Explain 3R technique w.r.t.reducing e-waste

Any two from the following with **one mark** for each. Explaining is important.
No mark awarded for just writing *reduce, reuse, recycle.*

- Reduce - Reduce unnecessary purchase/use/accumulation of electronic devices
- Reuse – Reuse/sell/donate/repair old electronic devices without discarding
- Recycle – Recycle the components in irreparable electronic devices

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

A person wants to protect a spreadsheet in his computer from unauthorized access. The computer is not connected to the Internet. Write one way how he could do this.

using a password (for the computer account / spreadsheet)

(b)----------[1]

A person cannot afford to buy licensed spreadsheet software for his computer. Write one thing that he could do.

Any **one** of the following:

- installing open source spreadsheet / LibreOffice Calc / OpenOffice Calc software
- using a free cloud based spreadsheet / Google Sheets software // using cloud computing

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(c)----------[1]

Write down one benefit that the students can obtain through this LMS

Any **one** of the following:

- obtaining study notes / supplementary study material
- getting feedback / results (from teachers)
- online assignment / tutorial submissions
- participating in online quizzes
- participating in discussions / forums // communicating with teachers / students
- getting notices
- studying convenience // less paper work // anytime/anywhere studying // studying at own pace
- learn well due to multi-modal / novel experience

(d)----------[1]

A student wants to include in his essay, a part of the content of a website without intellectual property violations. How can he do it?

Any **one** of the following:

- citing / mentioning the rightful owner and his (her) information
- quoting (with inverted commas) and giving the details of the owner
- referencing / listing of resources from which the information was collected
- obtaining permission from author (and indicating it)

(e)----------[2]

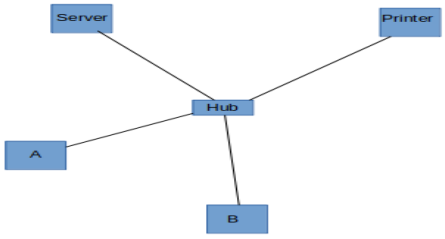
A manager in a Colombo office wants to have a video conference with managers in Jaffna and Matara branches without everybody coming to a single location. Write down the requirements needed in these locations.

Two marks for any **one** of the following. If incomplete, give **one mark**.

- Multimedia computer / laptop **and** communication software **and** Internet
- Computer (with audio hardware) **and** webcam **and** communication software **and** Internet
- Video conferencing kit **and** Internet

(iv)----------[1]

An office wants to create a computer network using a *hub*, three computers (named s*erver, computer A, computer B)* and a *printer* using a *star topology. Draw the topology diagram.*



3. (i) (a)----------[1]

Primary key of team table

Exact spelling important. Ignore case and space defects.
TeamID

(b)----------[1]

Two possible primary keys in the Player table

Exact spelling important. Ignore case and space defects.
PlayerID, StudentID

(ii) (a)----------[2]

Which tables need to be updated to add a new student of the school to the U17 Cricket team?

One mark per each. **Exact spelling** important. Ignore case and space defects.

Player, Player_Team

(b)----------[1]

Which tables need to be updated to make Nimal Fernando the captain of the U19 Football team?

Exact spelling important. Ignore case.
Team

(iii) (a)----------[2]

Record entries needed for **ii (a)** above

One mark per each. Ignore case and space defects.
Player→ (P1120, Piyal, Alwis, S4205) ✓
Player_Team→ (T2, P1120, 2019) ✓

(b)----------[2]

Record entries needed for the creation of U17 Football team with Shane Almaida as captain

One mark per each (Ignore case and space defects)
Team→ (T7, Football, U17, P1005) ✓
Player_Team → (T7, P1005, 2019) ✓

(iv)----------[1]

Which tables are to be joined to write a query to find the name of the U19 Cricket captain?

Exact spelling important. Ignore case.
Team, Player

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4. (i)----------[3]

Match statement labels to terms

Three marks for **5-6** correct, **Two marks** for **3-4** correct, **one mark** for **1-2** correct.

A – DNS Service, B – FTP, C – SMTP, D – lk, E – Search engines, F – @ ✓

(ii)----------[2]

Write down examples for software, languages, etc.

Two marks for **3-4** correct, **one mark** for **1-2** correct.

A – Mozilla firefox, B – PHP, C – Kompozer, D – Joomla ✓

(iii)----------[5]

Select html tags

Exact spelling important.

Five marks for **9-10** correct
Four marks for **7-8** correct
Three marks for **5-6** correct
Two marks for **3-4** correct
One mark for **1-2** correct

1 - head
2 - h2
3 - img
4 - p
5 - tr
6 - th
7 - td
8 - ul
9 - ol
10 - href

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5. **(i)** and **(ii)**----------

(i) Formula for C43 to calculate average mark for Subject 1

(ii) After copying above formula, write down what will appear in D43

	(i)	**(ii)** Mark this **only if** **(i)** correct
	=average(C3:C42)	=average(D3:D42)
or	=average(C42:C3)	=average(D42:D3)
Marks	**[2]**	**[1]**

(iii) **(a)** and **(b)**----------

(a) Formula for F3 to compute Kamal's z-score for Subject 1

(b) Copied formula for F42 to compute Kahn's z-score for Subject 1

	(a)	**(b)** Mark this **only if** **(a)** correct
	=(C3-$C$43)/$C$44	=(C42-$C$43)/$C$44
or	(C without preceding $) =(C3-C$43)/C$44	=(C42-C$43)/C$44
or	(C with preceding $) =($C3-$C$43)/$C$44	=($C42-$C$43)/$C$44
or	A combination of above	Appropriate copied output
Marks	**[2]**	**[1]**

(iv)----------**[2]**

Formula for I3 to compute final Z score for Kamal using only COUNT and SUM

=SUM(F3:H3) / COUNT(F3:H3) // =SUM(H3:F3) / COUNT(H3:F3)
// or a combination of above

Do not give marks for **any other** complicated, long formulas.

(v)----------**[2]**

Formula for I44 to print highest Z score

=MAX(I3:I42) // =MAX(I42:I3)

Note: Reduce **one mark** if either the required cell address is given before the equal sign **or** if the equal sign is missing.

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

Terms for SDLC related labels

Two marks for **4-5** correct, **one mark** for 1-3 correct.
A – S, B – Q, C – P, D – R, E – T ✓

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

Write one input in the school bookshop system

Any **one** of the following:

- item code
- quantity

(b)----------[2]

Write one process

Any **one** of the following:

- computing / calculating (or similar meaning) total cost of each item
- computing / calculating (or similar meaning) total bill value

(c)----------[1]

Write one output

Any **one** of the following:

- total cost of each item
- total bill value
- final bill

(iii)----------[2]

Match system development related scenario labels to term lables

Two marks for **3-4** correct, **one mark** for **1-2** correct.
A – T, B – P, C – S, D - R ✓

(iv)----------[2]

List **two** benefits of a computer based information system over a manual information system

Any **two** of the following with **one mark** each:

- speed // efficiency // doing many tasks simultaneously
- accuracy // reliability // consistency // no errors as in manual systems
- availability // accessibility
- easy for people // never getting tired
- simultaneous usage by multiple users
- quick storage and retrieval
- efficient storage // ability to store lot of data in a small area
- ability to customize / extend easily
- confidentiality // ease of privilege separation // ease of auditing
- ease of duplication / backing up / maintenance

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7. (i) (a)----------[2]

Output of the pseudo code when it is executed on array

65
(for additional output reduce one mark)

(b)----------[3]

Statements for P, Q,R

One mark per each. Ignore case.

P: Is A[k] < Value? ✓
Q: k = k+1 ⇦ ✓
R: Display Value ✓

(c)----------[2]

Redraw array A after assignments

Two marks for **4-5** correct, **one mark** for **1-3** correct.

A[0]	A[1]	A[2]	A[3]	A[4]
80	45	88	65	72

✓

(ii)----------[3]

Statements for P, Q, R

One mark per each. Ignore case.

P: Is L2=L3? ✓
Q: DISPLAY “Isoceles triangle” ⇦ ✓
R: DISPLAY “Scalene triangle” ✓

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