

**General Information Technology Examination
2019,2020,2021,2022(2023)**

**Marking Scheme
Paper I**

Question No.	Answer No.	Question No.	Answer No.	Question No.	Answer No.	Question No.	Answer No.
01.	2	11.	1	21.	4	31.	2
02.	2	12.	2	22.	Any option	32.	1
03.	4	13.	3	23.	2	33.	4
04.	3	14.	4	24.	3	34.	3
05.	1	15.	1	25.	2	35.	1
06.	3	16.	3	26.	2	36.	3
07.	2	17.	3	27.	3	37.	1
08.	2	18.	3	28.	1	38.	4
09.	3	19.	3	29.	2	39.	4
10.	4	20.	2	30.	1	40.	1

Special Instructions:

01 Mark for each question

Total Marks 01 × 40 = 40

(i)
What are the factors you consider for a desktop computer for video editing? (10 marks)

Answer

- a) **Processor Power or Model:** The processor is one of the most critical components. A more powerful processor can handle video editing software and render videos faster.
- b) **Processor Generation:** Newer generations tend to offer better performance and power efficiency.
- c) **RAM:** Video editing software can be memory-intensive.
- d) **Memory Type:** DDR4 or DDR5 RAM is preferable for faster data access and smoother video editing.
- e) **Storage/ Hard disk capacity:** Solid State Drives (SSDs) are much faster than Hard Disk Drives (HDDs). It's recommended to have an SSD for the operating system and software, and a larger HDD for storing video files.
- f) **Graphics Card:** A dedicated graphics card with a significant amount of video memory (VRAM) can accelerate rendering and playback.
- g) **Operating System:** Ensure that the computer runs a stable and compatible operating system. Windows 10 or a newer version is a common choice.
- h) **Display Size and Resolution:** A larger and high-resolution monitor provides a better workspace for video editing.

Any 5 from a) to h)

Each of them gets 02 marks

(total 10 marks)

Note:

If the "Processor Speed" is mention give 1 mark.

(ii)

Select one of the three specifications given and justify your answer. (09 marks)

Answer

Among the three computer options provided, Computer 3 seems to be the most suitable for video editing. Here's the justification:

- **Processor:** Computer 3 has an Intel Core i5 processor from the 3rd generation, and the i5 offers better performance than the i3.
- **RAM:** Computer 3 has 8GB of RAM, which is more memory than the 4GB found in Computers 1 and 2. Video editing can be RAM-intensive, so the extra RAM in Computer 3 will enable smoother editing and multitasking.
- **Hard Drive:** All three options have HDDs, which are slower than SSDs, but Computer 3 has the largest capacity at 500GB, providing ample space for video files.
- **Display Size:** Computer 3 offers a 22" LED monitor, which is larger than the 20" monitor in Computer 1 and the 19" monitor in Computer 2. A larger display is preferable for video editing tasks.

Selection of "Specification 3" gets 3 marks

RAM and any 02 items below gets 06 marks (02 marks each)

- Intel Core i5
- 500GB hard disc capacity
- Dell 22" LED Monitor

(total 09 marks)

(iii)

Write at least 150 words article to a newspaper encouraging every citizen to have an understanding on basic computer hardware. (06 marks)

Answer

Article should address following issues/ points:

1. In today's digital age, computers have become an integral part of our lives
2. understanding basic computer hardware is a skill that every citizen should possess
3. Few examples of application computers in everyday life where computer hardware play a major role
4. When buying a computer, knowing the difference between processors, RAM, and storage options can help you make a smart purchase
5. Basic knowledge of computer hardware allows you to upgrade your system when needed.
6. Understanding storage devices helps you manage your data effectively.
7. Knowing the hardware components can make you more aware of potential security risks.
8. Understanding hardware can help you troubleshoot video call issues, configure your microphone and camera, and ensure your online meetings run smoothly

Any three (03) from the list on the left-hand side should be included in the article.

Each item in the list gets 02 marks

If the answer is not in an article form then reduce 01 mark.

(total 06 marks)

(i)
Identify three logical connectives and explain their functionalities. (09 marks)

Answer

a) OR (Disjunction):

The OR connective is represented by the symbol " \vee " or simply the word "or." It is true if at least one of the statements it connects is true. It is false only when both statements are false.

b) AND (Conjunction):

The AND connective is represented by the symbol " \wedge " or simply the word "and." It is true only when both statements it connects are true. If any one of the statements is false, the entire compound statement is false.

c) NOT (Negation):

The NOT connective is represented by the symbol " \sim " or " \neg ." It negates the truth value of a statement. If a statement is true, its negation is false, and vice versa.

- "OR" Connective/ Symbol gets 03 marks
- Explanation of the OR connective/ truth table for the OR gate 01 mark.

- "AND" Connective/ Symbol gets 03 marks
- Explanation of the AND connective/ truth table for the AND gate 01 mark.

"NOT" Connective gets 01 mark

If students state that the given scenario has only 02 logical connectives, they can get 01 mark

(total 09 marks)

(ii)

Draw a truth table for the above admission criteria. (10 marks)

Answer

Let:

- I: Three passes in the physical science stream of GCE (A/L)
- IIa: Three passes in any other stream of GCE (A/L)
- IIb: Successfully completed an acceptable foundation course in Information Technology with sufficient Mathematics
- AC: Admission Criteria ($I \vee (IIa \wedge IIb)$)

I	IIa	IIb	AC ($I \vee (IIa \wedge IIb)$)
0 (F)	0 (F)	0 (F)	0 (F)
0 (F)	0 (F)	1 (T)	0 (F)
0 (F)	1 (T)	0 (F)	0 (F)
0 (F)	1 (T)	1 (T)	1 (T)
1 (T)	0 (F)	0 (F)	1 (T)
1 (T)	0 (F)	1 (T)	1 (T)
1 (T)	1 (T)	0 (F)	1 (T)
1 (T)	1 (T)	1 (T)	1 (T)

In the truth table, "1" or "T" represents "True," and "0" or "F" represents "False." The last column represents the truth value of the entire admission criteria (AC) for different combinations of I, IIa, and IIb.

Marks for defining logical variables, Ar

- **04 marks** for Identification of three logical variables (names can be different but the used names should be mapped into three admission criteria).
- If only two logical variables defined give 02 mark
- If only one logical variables defined give 01 mark

Marks for logical truth values

- **03 marks** for setting the correct truth values for three logical variables.
- **03 marks** for correct computing of AC for all the patterns. **02 marks** for 04 correct computations and 01 mark for at least one correct computation.

If students used variable names not given in the question, they should define their variables clearly. At least the output should be defined using input variables.

(total 10 marks)

(iii)

Discuss the suitability of a truth table to represent the above admission criteria. (06 marks)

Answer

- A truth table is a suitable tool to visualize the admission criteria because it provides a clear and systematic representation of how the criteria evaluate different scenarios.
- The truth table is also helpful in identifying when the criteria are met and when they are not, making it easier to determine eligibility.
- It's a concise way to account for all possible combinations of the individual criteria (I, IIa, and IIb) and their interactions, ensuring a fair and transparent admission process.

02 points x 03 marks

(total 06 marks)

(i)

What is a web authoring tool? Explain. (08 marks)

Answer

A web authoring tool is a software application or platform that allows individuals,

- even those without extensive coding knowledge,
to
- create and manage web content, websites, and web applications.
These tools
- simplify the web development process
by providing
- a user-friendly interface
that allows users to design, structure, and format web pages
- without needing to write code from scratch.

Some common examples of web authoring tools include Adobe Dreamweaver, WordPress, Wix, and Squarespace.

OR

These tools typically offer features such as

- visual editors,
- templates,
- drag-and-drop functionality, and
- pre-built components,
- WYSIWYG

making it easier for individuals to create web content and publish it on the internet.

Any 02 underlined terms/phrases in the given answer.

Each underlined term/phrase gets 2 marks

(total 08 marks)

<p>(ii) Propose a web authoring tool known to you which can be used for this task and explain how you can develop this application using it.(12 marks)</p> <p><u>Answer</u></p> <p>Students should discuss the features in underlined terms/phrases in the above answer to (i) and show that those features are available in the Web Authoring Tool they proposed.</p>	<p>Show any 04 underlined terms/phrases in the proposed tool.</p> <p>Each underlined term/phrase available in the proposed tool gets 03 marks</p> <p>(total 12 marks)</p>
<p>(iii) Discuss the advantages of web authoring tools. (05 marks)</p> <p><u>Answer</u></p> <ul style="list-style-type: none"> A. No Coding Skills Required B. Faster Development C. User-Friendly D. Cost-Effective E. Community Support F. Templates and Themes 	<p>If "No Coding Skills Required" that is the Option A is mentioned give 02 marks</p> <p>If "Faster Development" that is the Option B is mentioned give 02 marks</p> <p>Any other from C,D,E, and F gets 01 mark</p> <p>(total 05 marks)</p>

(i) Define e-Waste and state the major contributors to e-Waste. (10 marks)

E-waste definition

Electronic waste or e-waste describes discarded electrical or electronic devices.

E-waste is electronic products that are unwanted, not working, not functional (obsolete) and nearing or at the end of their "useful life."

Major contributors to e waste

Computers
Televisions (TV)
Video cassette recorders (VCR)
Compact Discs (CD)
Photocopiers
Fax machines
Mobile phones
Batteries etc...)

If the answer contains the word or meaning of "Discard/Unwanted/not working/not functioning/end of their useful life" give 03 marks i)

If the answer contains the words or meaning of "electrical or electronic devices" gets another 03 marks pl
e)

02 mark x 2 acceptable contributors

(Total 10 marks)

<p>(ii) Explain the negative impact of e-waste to the environment. (09 marks)</p> <ul style="list-style-type: none"> A. Air pollution when they burned B. Landfills C. Hazardous materials contaminated with groundwater D. Impact for biodiversity/ecosystem E. Impact for human health F. Climate change through carbon footprint G. Accumulation of waste H. Impact on agriculture 	<p>Answer should have an impact on</p> <ul style="list-style-type: none"> • Living Being <p>AND</p> <ul style="list-style-type: none"> • Environment (any two) <ul style="list-style-type: none"> ○ Air ○ Water ○ Soil ○ etc. <p>03 marks x 03 explanations (Total 09 marks)</p>
<p>(iii) Explain how you can manage e-waste using the 3R concept (Reduce,Reuse,Recycle). (06 marks)</p> <p>Reduce</p> <ul style="list-style-type: none"> a. Purchase products with multiple functions Opt for electronic devices that serve multiple purposes or have integrated features, reducing the need for multiple gadgets. b. Think the need of the product before purchasing Consider the necessity of a product before buying it, avoiding unnecessary electronic purchases that contribute to e-waste. c. Purchase Durable Products Choose electronic devices known for their durability and reliability. <p>Reuse</p> <ul style="list-style-type: none"> a. Sell electronics which are not in use <ul style="list-style-type: none"> • Instead of discarding unused electronics, sell them to others who might find them valuable, extending the lifespan of the device. • Use online marketplaces to sell or trade electronics that are still in good working condition. • Some retailers and manufacturers offer trade-in programs, allowing users to exchange old devices for discounts on new ones. 	<p>At least one way of implementing reduce,reuse and recycle 2 marks for each x 3 ways=6 marks</p> <p>(How to reduce , How to reuse, How to recycle)</p> <p>NO MARKS FOR WRITING 3R AS IN THE QUESTION.</p>

- b. Repair broken electronics
Fixing malfunctioning devices can prolong their usability and prevent them from becoming e-waste prematurely.
- c. Donate old devices to charities
Donating still-functional electronics to charities or organizations can benefit others while preventing unnecessary disposal.
- d. Maintain the purchased electronics.
Regular maintenance can help extend the life of electronic devices, reducing the frequency of replacements
- e. Share with Family or Friends
Pass down old electronics to family members or friends who may still find them useful.
- f. Create a Sharing Network
Establish local networks for sharing electronics among community members, fostering a culture of reuse and reducing individual ownership.

Recycle

- a. Buy products that can be recycled/environmental friendly
Choose electronics with materials that are recyclable and adhere to environmental standards, reducing the environmental impact.
- b. Buy recycled products
Support the use of recycled materials by purchasing products made from recycled content, contributing to the demand for recycling processes.
- c. Invent new ideas of recycling
- d. Avoid buying hazardous items which are impossible to recycle
Refrain from purchasing products that contain hazardous materials or are challenging to recycle, minimizing the potential environmental harm.
- e. Use renewable energy sources
Incorporating renewable energy into the lifecycle of electronic devices is part of a holistic approach to environmental sustainability. It contributes to reducing the environmental impact at various stages of the electronic device lifecycle, from manufacturing and use to end-of-life management, thus indirectly influencing the generation and management of e-waste. When electronic devices are powered by renewable energy, it contributes to a cleaner energy lifecycle. As a result, the devices themselves might last longer since they are less likely to be exposed to pollutants associated with traditional energy sources. This can help extend the overall lifecycle of electronic devices. This is indirectly supporting recycling.

<p>(i)</p> <p>There are many tools including <u>Zoom App</u>, <u>Google Meet</u>, and <u>Microsoft Teams</u>.</p> <p>Each of these tools have facilities for <u>large number of participants</u>, <u>screen sharing</u>, <u>recording</u>, <u>presentations</u>, <u>speaker view</u>, <u>chat</u>, <u>polls</u>, <u>breakout rooms</u>, <u>whiteboards</u> and ensure the security of the information.</p>	<p>4 marks for any tool</p> <p>2 mark for each x 3 facilities = 06 marks</p> <p>(total 10 marks)</p>
<p>(ii)</p> <p><u>Password protected</u> the documents. Send passwords <u>separately</u>.</p> <p>Use an <u>encrypted channel</u></p> <p>Share files in a <u>groupware</u></p> <p>Use a <u>VPN</u></p> <p>Use a <u>secure cloud computing service</u></p> <p>Send using <u>offline modes</u> (courier a CD)</p>	<p>02 marks for "Password protect" or "Encrypted"</p> <p>01 marks for "separately"</p> <p>3 marks for each way x 2 ways = 06 marks</p> <p>(total 09 marks)</p>
<p>(iii)</p> <p>Methods:</p> <ol style="list-style-type: none"> 1. Verbal communication 2. Text messages 3. Encrypted channels such as WhatsApp, Teams 4. Password vaults 	<p>03 marks each x 2 methods (from 4 in the list of methods given on the left-hand side).</p> <p>There may be multiple tools supporting one method.</p> <p>(total 06 marks)</p>

(i)

Explain the benefits of formulae in spreadsheets. (07 marks)

Time-saving: Formulas can save a lot of time by automating calculations and eliminating the need for manual calculations.

Once a formula is set up, it can be used repeatedly with different data inputs.

Accuracy: Formulas can perform complex calculations with a high degree of accuracy, reducing the risk of errors and improving the quality of the output.

Consistency: Formulas ensure consistency in calculations across different data sets, ensuring that results are comparable and reliable.

Flexibility: Formulas can be easily modified to include different variables, adjust for changes in data sets, and accommodate new scenarios or requirements.

Analysis: Formulas can be used to analyze data, perform what-if scenarios, and identify trends and patterns that may not be immediately apparent from the raw Data.

Ease of use: Excel provides a wide range of pre-built formulas that can be easily accessed and applied to data sets without requiring extensive coding or programming skills.

1. One benefit with no explanation (03 marks)
2. Two benefits with n explanation (04 marks)
3. One benefit with explanation (04 marks)
4. Two benefits with explanations (07 marks)

(total 07 marks)

(ii)

Draw a sketch of the spreadsheet to calculate the monthly income tax for a given total income for tax calculation. Explain the content of each cell in your spreadsheet. (10 marks)

(1) Correct syntax of **relevant** formulae

(2) Possibility of deriving the final tax amount using the spreadsheet

- One column to specify the description of tax components
- One column for tax rates (percentages)
- One column to input taxable amounts
- One column to compute tax amounts

A user should decide the taxable amounts for each tax component **after multiplying the monthly taxable income by 12.**

A Sample worksheet is given below.

	A	B	C	D
1	Tax Component	Tax Rate	Annual Taxable Income	Taxable Amount
2	1st Rs 500,000	6%		=B2*C2
3	Next Rs 500,000	12%		=B3*C3
4	Next Rs 500,000	18%		=B4*C4
5	Next Rs 500,000	24%		=B5*C5
6	Next Rs 500,000	30%		=B6*C6
7	For the balance	36%		=B7*C7
8	Total Tax Amount			=sum(D2:D7)
9	Monthly Tax Amount			=D8/12

Note:

There can be three cases:

- Use of annual taxable income**
- Use of monthly taxable income** (divide values in the column A by 12)
- Use of monthly taxable income** (divide values in the column B by 12)

Please consider these three cases.

The above diagram depicts the Case 1. It solves the problem for a single person, however, a solution for multiple persons can also be given.

Correct formulae/functions which are not included in the syllabus can be used and should be considered for giving marks, if used.

(3) Draw a sketch of a worksheet with monthly tax calculation

01 mark x 02 correct formulae
(Excel point of view)
In case of repeating a formula only 01 mark will be given.

01 mark
01 mark
01 mark
01 mark

04 marks

(Total 10 marks)

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(iii)

Describe the formatting you applied in the spreadsheet. (08 marks)

- Use of correct currency formatting with LKR in three places
- Use of text formatting in three place
- Special formatting to show the final tax
- Table border formatting or other acceptable formatting

02 marks

02 marks

02 marks

02 marks

(total 08 marks)

(i) Readers should be introduced to three commonly used operating systems. (06 marks)

1. **Microsoft Windows:**

- Known for its user-friendly interface, Windows dominates the desktop environment.
- It supports a wide range of software and is widely used in professional and personal settings.

2. **macOS:**

- Developed by Apple, macOS runs on Apple hardware.
- It's prevalent in creative industries and is recognized for its stability and security features.

3. **Linux/Ubuntu:**

- Linux is an open-source operating system widely used in server environments and embedded systems.
- Its flexibility and robustness make it a favorite among developers and tech enthusiasts

4. **iOS**

5. **Android**

Any 03 currently used OS
Each gets 02 marks.

01 mark for document for
Maximum 06 marks

(Total 06 marks)

<p>(ii) Introduce five functions of a modern operating system in such a way that readers can understand what is happening inside a computer. (10 marks)</p> <ol style="list-style-type: none"> Process Management: <ul style="list-style-type: none"> OS oversees processes, ensuring each task gets the necessary resources and executes efficiently. Memory Management: <ul style="list-style-type: none"> It allocates and deallocates memory space, optimizing usage and preventing conflicts among different applications. File System Management: <ul style="list-style-type: none"> OS organizes and manages files, facilitating data storage, retrieval, and organization on storage devices. Device Management: <ul style="list-style-type: none"> It controls and coordinates peripheral devices, allowing the computer to communicate with external hardware. User Interface Security and Protection: <ul style="list-style-type: none"> OS implements security measures to safeguard data, restrict unauthorized access, and protect against malware. 	<p>01 mark each for the name of the function.</p> <p>01 mark each for a brief explanation.</p> <p>01 mark for document format Maximum 10 marks</p> <p>(total 10 marks)</p>
<p>(iii) The role of a booting process of an operating system when booting a computer should be clearly presented. (09 marks)</p> <ol style="list-style-type: none"> Power-On Self-Test (POST): <ul style="list-style-type: none"> When the computer is powered on, the POST routine checks hardware components to ensure they are functioning correctly. Bootstrap Loader (MBR): <ul style="list-style-type: none"> After POST, the system searches for the bootstrap loader, a small program residing in the computer's ROM or BIOS. Kernel Initialization: <ul style="list-style-type: none"> The kernel, the core of the operating system, is loaded into memory. It initializes essential system processes and starts managing hardware and software resources. Initiation of User Interface: <ul style="list-style-type: none"> Once the kernel is loaded, the user interface is initiated, allowing users to interact with the computer. 	<p>09 marks for the process with the steps in the correct order which includes the points mentioned on the left side.</p> <p>if all the booting process steps are mentioned but not in the correct order give 06 marks.</p> <p>01 mark for document format</p> <p>Maximum 09 marks</p> <p>(total 09 marks)</p>