Class 7

Answer Key

Trackpad PRO (Ver. 5.1)

1. Number System

QuizBee

Page-11

11010

ASSESS YOURSELF

1.	a. (i)	b. (iv)	c. (ii)	d. (i)	e. (i)
2.	a. Byte	b. 8	c. 0 and 1	d. Base-10	e. A to F
3.	a. F	b. T	c. F	d. T	e. T
4.	a. Bit	b. 4	c. 10	d. 4	

5. a. A number system is a way to express quantities used for counting, comparing amounts, performing calculations and representing values.

b.

Decimal Number system	Hexadecimal Number system
A number system made up of 10 digits from 0 to 9, is known as decimal number system. The base of the decimal number system is 10. It is also known as the base-10 system.	A number system made up of sixteen symbols, 0 to 9, and A to F is known as the hexadecimal number system. When the hexadecimal number system is used, every number is formed using 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E and F, where A = 10, B = 11, C = 12, D = 13, E = 14, and F = 15. The base of the hexadecimal number system is 16. It is also known as the base-16 system.

c. To convert a binary number into a decimal number, follow the given steps:

1. Multiply each digit of the binary number by 2 to the power of n, where n is the position of the digit starting from 0 on the right.
2. Add the result.

Example:

Convert $(101001)_2$ to decimal number.

$= (1\times2^5) + (0 \times 2^4) + (1 \times 2^3) + (0 \times 2^2) + (0 \times 2^1) + (1 \times 2^0)$

Sum of the products = 32 + 0 + 8 + 0 + 0 + 1 = 41

Therefore, $(101001)_2 = (41)_{10}$

d. A number system made up of eight digits from 0 to 7, is known as the octal number system. When the octal number system is used, every number is formed using 0,1,2,3,4,5,6 and 7. The base of the octal number system is 8. It is also known as the base-8 system. Each positioning number represents the power of base 8.

e.

Decimal	Binary
22	10110
29	11101
95	1011111
Invalid Binary Number	101110112

6. a. (i) $(14)_{10}$ (ii) $(1001011)_2$
(iii) $(101)_{10}$ (iv) $(78)_{10}$

b. (i) $(11100)_2 - (1010)_2 = (10010)_2$ (ii) $(1101)_2 + (1010)_2 = (10111)_2$
(iii) $(100110)_2 - (11001)_2 = (11101)_2$ (iv) $(1000)_2 + (101)_2 = (1101)_2$

7. a. Do it yourself b. Do it yourself c. Do it yourself

8. a. Nilay should follow the given steps to convert a decimal number into a binary number:

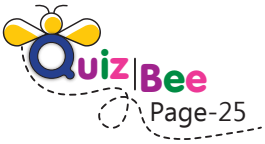
1. Divide the decimal number by 2 while keeping track of the quotient and remainder.
2. Continue dividing the quotient by 2 until you get a quotient of less than 2.
3. Then write the remainder in the reverse order (from bottom to top) to obtain the binary equivalent.

b. Hexadecimal Number System has been used here. The hexadecimal number system has made the representation of large values easy. The hexadecimal numbers are used to represent colours on a webpage, that's why programmers now prefer hexadecimal numbers.

{CODING ZONE}

Do it yourself.

2. Advanced Features of Excel



Custom Sorting means arranging the data either in ascending or descending order as per our requirement with other columns.

ASSESS YOURSELF

1. a. (ii) b. (iii) c. (ii) d. (i) e. (i)
2. a. Filter b. IF c. Custom Sort d. Sort A to Z
3. a. F b. T c. F d. T
4. a. Sorting b. Filtering c. Conditional Formatting
   d. Formulas
5. a. To apply filters, follow the steps given below:
   1. Click on the Sort & Filter command.
   2. Select the Filter option from the drop-down list.

      The list appears with the drop-down controls or the Filter switches on the right side of the column headings.
   3. Click on Filter Switch.
   4. Tick the desired checkbox.
   5. Click on the OK button.

   b. To use Custom Sorting, follow the steps given below:
   1. Select a column or range of the data to be sorted.
   2. Click on the Sort & Filter command.
   3. Select the Custom Sort option.
   4. Click on the Add Level button to add another column to sort.
   5. Click on Then by down arrow in the Column section.
   6. Click on the OK button.

   c. Conditional formatting in Excel automatically changes cell appearance based on specified rules or conditions.

To apply conditional formatting to a series of data, follow the given steps:

1. Select the data and click on the Conditional Formatting command.
2. Select the desired option.
3. Choose desired fill effect.

d. Data can be sorted in two ways:

Ascending order: Arranging data in increasing order, for example, letters from A to Z, numbers from lowest to highest, etc.

Descending order: Arranging data in decreasing order, for example, letters from Z to A, numbers from highest to lowest, etc.

6. a. (i) Result: 135 (ii) Result: 5

b. Result: Fail

7. a. Sara can use Conditional Formatting to highlight the scores above 90.

b. To use the IF() function to label each student as "Pass" if their score is 60 or above and "Fail" if below, Raj should follow the given steps:

1. Enter the students' names in column A and their scores in column B.
2. Enter the following formula in column C (or any other column):

   =IF(B1>=60, "Pass", "Fail") and press Enter key.
3. Drag down to apply it to all students.

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1. =SUM(D3:D10)
2. =IF(E1>=18, "Eligible", "Not Eligible")
3. Sort a dataset by two columns: first by 'Grade' in ascending order, and then by 'Name' in alphabetical order, follow the given steps:

1. Select a column or range of the data to be sorted.
2. Click on the Sort & Filter command.
3. Select the Custom Sort option.

   A Sort dialog box will open.
4. Click on the Add Level button to add another column to sort.
5. Click on Then by down arrow in the Column section. Select Name in this case.
6. Click on the OK button.

Further, more levels can be added to the Sort dialog box for sorting the given data in a spreadsheet.

3. More on Krita

ASSESS YOURSELF

1. a. (iii) b. (ii) c. (ii) d. (ii) e. (ii)
2. a. Tab b. Polygonal Selection c. Layer d. Ctrl +]
3. a. Resizing b. Selection tool c. Ctrl + Shift + D d. Freehand Selection
4. a. Krita uses layers to help you manage different parts of your artwork more easily. They can be transparent or solid, bigger or smaller than your whole drawing, and you can stack them on top of each other, name them, and group them together. Layers allows you to edit different parts of your artwork without affecting the other.

   b. To use the Gradient tool, follow the given steps:

   1. Select the Gradient Tool.
   2. Select the desired pattern from the Shape drop-down list under the Tool Options docker.
   3. Click and drag on the drawing from one end to the other to form a line. This line determines the length of the gradient.

   c. To duplicate a layer, follow the given steps:

   1. Select the layer that you want to duplicate.
   2. Click on the Duplicate layer or mask button at the bottom of the Layers docker.

   d. To create a new layer, follow the given steps:

   1. Click on Layer menu from Menu bar.
   2. Select the New option and then choose the type of layer you want to create.
5. a. Samaira should place the road image on the background layer and each character on separate layers above it. This way, she can edit or move characters without affecting the background. Layers allow easy editing, better control, and non-destructive workflow, making the art process flexible and organised.

   b. Gunjan should use the Polygonal Selection Tool to select the shirt and pants accurately. It offers precise control, handles complex shapes, and allows her to change colours cleanly without affecting other areas.

{CODING ZONE}

1. (c) 2. (a) 3. (c) 4. (c)

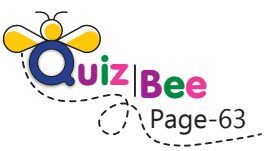
Periodic Assessment 1

(Based on chapters 1 to 3)

1. 1. a. (iii) b. (i) c. (iv) d. (ii)
2. a. The IF() function checks a condition to evaluate whether it as true or false and based on the result, suitable actions are performed.

   b. The SUM() function calculates the total of a given set of values.
3. a. Editing b. Filter c. Sort d. Conditional Formatting
4. 1. c. 2. d. 3. b. 4. a.

4. Lists and Tables in HTML5



The border property is used to define the border of a table.

ASSESS YOURSELF

1. a. (i) b. (i) c. (ii) d. (ii) e. (iii)
2. a. <Style> b. Terms c. Cells d. Border
3. a. F b. T c. F d. F
4. a. list-style-type: value; b. <DD> c. Nested list

   d. <TH> e. Padding
5. a. ORDERED LISTS An ordered list is used when the items in the list are required to be in a particular order and need to be numbered. It is also known as a numbered list. An ordered list is enclosed within the <OL> ... </OL>. tag. Each item in the list is given an <LI> tag that specifies the list item. By default, it starts with numbers.

   UNORDERED LISTS An unordered list is used when the items in the list are not required to be in a specific order. It is also called a bulleted list. An unordered list is enclosed within the <UL> ... </UL>. tag. Each item in the list is given an <LI> tag, which specifies the list item.

b. An item on a list can contain another list. The list within a list is known as a nested list or sub-list.

HTML code to create a nested list.

```
<!DOCTYPE html>
<HTML>
<HEAD><TITLE> Nested List</TITLE></HEAD>
<BODY>
<H1>List of Fruits and Vegetables</H1>
<OL>
<LI> List of Fruits
<UL>
<LI>Apple</LI>
<LI>Watermelon</LI>
<LI>Orange</LI>
<LI>Strawberry</LI>
</UL>
</LI>
<LI> List of Vegetables
<UL>
<LI>Mushroom</LI>
<LI>Potato</LI>
<LI>Carrot</LI>
<LI>Sweet Potato</LI>
</UL>
</LI>
</OL>
</BODY>
</HTML>
```

c. <DL> (Definition List): This tag indicates the beginning of a definition list, grouping terms and their corresponding descriptions.

<DT> (Definition Term): This tag specifies the name or terms being defined within the list.

<DD> (Definition Description): This tag provides a description or explanation for each term listed, following the <DT> tag.

d. We can organise the content on a web page using lists. Lists are used to group related pieces of information together to make it convenient and easy to read. Tables are used in HTML to display data in a tabular format. Presenting information in a tabular form makes it easy to understand.

e. The default type of bullet that appears in an unordered list is a disc. We can change the default item marking of an unordered list to disc, circle, square, none.

Syntax: `<UL style="list-style-type:value">`

6. a. Sachin should use the CSS property `border-collapse: collapse;` inside the `<style>` tag.

b. Ayushi can use the border property to define the border of a table.

{CODING ZONE}

a.

i. Mangoes

ii. Apples

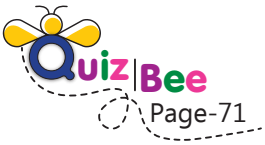
iii. Oranges

iv. Bananas

b.

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday

5. Images, Links and Forms in HTML5



1. It specifies which alternative text should be displayed if selected image is not displayed.
2. The process of linking a particular section of the same web page is called interlinking(Local) whereas, the process of linking a web page to another web page of the same website or another website is called intralinking(Global).

1.	a. (i)	b. (ii)	c. (ii)	d. (iv)	e. (iii)
2.	a. ALT	b. Inline	c. Audio	d. Hyperlink	
3.	a. F	b. F	c. T	d. T	e. T
4.	a. ALT	b. <A>	c. WAV, MP3, and OGG		
	d. Input	e. Inline Frame			

5. a. A website is a collection of web pages that are interlinked with each other and contains related information. These web pages are linked with the help of a feature of HTML called a hyperlink. HTML allows us to create two types of linking which are: Interlinking (Local): The process of linking a particular section of the same web page is called interlinking. In this case, the hyperlink and the linked section appear on the same web page. Hence, interlinking is also known as internal linking. Intralinking (Global): The process of linking a web page to another web page of the same website or another website is called intralinking. It is also known as external linking.

b. The two types of input controls used in HTML forms are: Text Input Controls and Checkbox Input Control.

(i) Text Input Controls: There are three types of text input controls used on forms:

a. Single-line text input control: It is used as a search box or name. The two attributes associated with single-line text input controls are: SIZE and MAXLENGTH.

b. Password input control: When selected, the checkbox is marked with a tick mark.

c. Multi-line text input control: This control allows us to enter multiple lines.

(ii) Checkbox Input Control: This control is used when multiple options from a group are required to be selected by the site-visitor. When selected, the checkbox is marked with a tick mark.

c. In HTML5, Frames(inline) are created using <iframe> tag, which embeds an independent HTML document into the current document.

Syntax:

```
<iframe src="url" title="description"></iframe>
```

We use the src attribute to specify the URL of the document that contains the inline frame and the title attribute to describe the content of the iframe.

Other attributes of `<iframe>` tag are Height and Width.

Example: `<iframe src="https://www.youtube.com/embed/VIDEO_ID" width="560" height="315"> </iframe>`

d. The HTML5 <AUDIO> and <VIDEO> and tags allow us to add media to a website. To add media, we are required to set the SRC attribute to identify the media source and include the controls attribute so the user can play and pause the media whenever required. We use <AUDIO> tag to embed sound content in an HTML document whereas <VIDEO> tag is used to embed video in an HTML document.

e. The two types of input controls used in HTML forms are: Text Input Controls and Checkbox Input Control.

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(ii) Checkbox Input Control: This control is used when multiple options from a group are required to be selected by the site-visitor. When selected, the checkbox is marked with a tick mark.

6. a. Vyom should use checkboxes using the `<input type="checkbox">` control. This allows users to select more than one option from a group.

b. Manvi can use the <img> tag to insert images into her website.

```
<img src="image.jpg" alt="Description of image" width="300" height="200">
```

{CODING ZONE}

```
<audio src="D:/Song.mp3" controls></audio>
```

6. Developing Mobile Apps

This view contains all the components required to design an application.

1. a. (i) b. (ii) c. (iii) d. (i) e. (iii)
2. a. F b. T c. T d. F e. F
3. a. Design View contains all the components required to design an application.

b. Two panes of the Project Designer window of App Inventor are:

(i) All Components pane: This pane shows a list of all the components added to the screen in a hierarchical view.

(ii) Properties pane: When we click on a component in the viewer, we see its properties listed here. Properties of the components can be changed from here.

c. To install an app from Play Store, follow the given steps:

1. Tap on the Play Store Icon.
2. Type the name of the app you want to install in the search box and click on the search button.
3. Tap on the app you want to install.
4. Tap on the Install option.

d. To test your app, go to the connected device or Emulator and click on the button. Your phone will read the phrase aloud. Keep the volume of your phone/laptop high.

e. Three components of Block Editor Window are:

(i) Workspace: It arranges all the blocks for coding in the workspace.

(ii) Trash: It is used for deleting blocks that are not required.

(iii) Backpack: It stores the copy of all the blocks even when we exit App Inventor.

4. a. Real Smartphone

- Benefits: Shows actual performance, touch interaction, and device-specific behaviour like camera, GPS, and sensor testing.
- Challenges: Requires physical access to the device and proper setup with the MIT App Inventor Companion app.

Emulator

- Benefits: Can test apps without a smartphone. Useful for quick debugging and checking basic layout and logic.
- Challenges: May not fully replicate hardware features, and performance can be slower than a real device.

b. The drag-and-drop feature in the Design View allows Riya to easily select and place components (like buttons, labels, and text boxes) onto the app screen without writing any code.

{CODING ZONE}

1. 37 2. (b)

PERIODIC ASSESSMENT 2

(Based on chapters 4 to 6)

1.
```
<!DOCTYPE html>
<html>
<head>
```

```
<title>Definition List</title>
</head>
<body>
<h3>Example of Definition List</h3>
<hr>
<dl>
<dt><b>Beverages</b></dt>
<dd>Hot and Cold Drinks</dd>
<dt><b>Cappuccino</b></dt>
<dd>Hot Drinks</dd>
</dl>
</body>
</html>
```

2. a. SRC stands for source. It specifies the location of the image.

   b. E-commerce apps are used for buying and selling goods or services online.

3. a. Google Play Store b. iOS
   c. Hybrid App d. Gaming Apps

Test Sheet 1

(Based on chapters 1 to 6)

1. a. (iv) b. (i) c. (iii) d. (ii)
   e. (ii) f. (ii) g. (iii)
2. a. 8 b. Filter c. Layer d. terms
   e. inline f. native, web g. Shift
3. a. T b. F c. T d. T
   e. F f. T
4. a. A number system made up of 10 digits from 0 to 9, is known as decimal number system. The base of the decimal number system is 10. It is also known as the base-10 system. A number system made up of sixteen symbols, 0 to 9, and A to F is known as the hexadecimal number system. The base of the hexadecimal number system is 16. It is also known as the base-16 system.

   b. To apply filters, follow the steps given below:

   1. To apply filters, follow the steps given below:
   2. Select the Filter option from the drop-down list.

c. The Gradient Tool is used when we want a blend of two or more colours in our background or image. It fills the colour with one click rather than multiple brush strokes.

d. In HTML5, Frames(inline) are created using <iframe> tag, which embeds an independent HTML document into the current document.

Syntax:

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<iframe src="url" title="description"></iframe>
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We use the src attribute to specify the URL of the document that contains the inline frame and the title attribute to describe the content of the iframe.

Other attributes of <iframe> tag are Height and Width.

Example: `<iframe src="https://www.youtube.com/embed/VIDEO_ID" width="560" height="315"> </iframe>`

e. Frames allow us to divide the web page into several independent parts or panes. The frames work as an independent window allowing multiple views at one time. These also help in making one-part static while allowing other parts to change as per our commands.

f. A number system made up of 10 digits from 0 to 9, is known as decimal number system. The base of the decimal number system is 10. It is also known as the base-10 system.

5. a. To convert a binary number into a decimal number, follow the given steps:

1. Multiply each digit of the binary number by 2 to the power of n, where n is the position of the digit starting from 0 on the right.
2. Add up all the resulting products. This sum gives you the decimal number.

b. To apply conditional formatting to a series of data, follow the given steps:

1. Select the data and click on the Conditional Formatting command.
2. Select the desired option.
3. Choose desired fill effect.

c. Steps involved in adding an image to a new layer in Krita are:

1. Click on the plus icon at the bottom left corner of the Layers docker to create a new layer.
2. Open the image you want to add as a new layer in Krita. Image opens in a new tab.
3. Select a part of or the whole image.
4. Click on the Copy option in the Edit menu.
5. Click on the window where you want to paste the copied image.

d. We can organise the content on a web page using lists. Lists are used to group related pieces of information together to make it convenient and easy to read. Tables are used in HTML to display data in a tabular format. Presenting information in a tabular form makes it easy to understand.

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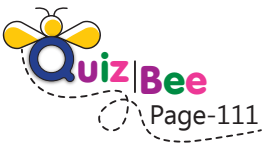
f. A number system made up of eight digits from 0 to 7, is known as the octal number system. When the octal number system is used, every number is formed using 0,1,2,3,4,5,6 and 7. The base of the octal number system is 8. It is also known as the base-8 system. Each positioning number represents the power of base 8.

7. Google Apps



1. Gmail 2. Google Drive

ASSESS YOURSELF

1.	a. (iii)	b. (iv)	c. (ii)	d. (i)	e. (iii)
2.	a. Syllabus	b. Broadcast	c. Arial	d. Google Translate	e. Drive
3.	a. F	b. T	c. T	d. F	e. T
4.	a. Google Forms	b. Google Drive	c. Google Slides	d. Gmail	e. Google Maps

5. a. Google has developed several web-based applications that are collectively known as Google Workplace. It was formerly known as Google Apps and later G Suite, which is a collection of tools like cloud computing, productivity and collaboration software and apps marketed by Google.

Uses of Google Workspace are as follows:

- No extra cost for hardware and software

- No need to upgrade hardware and software
- Secure and private Users' collaboration

b. Google Docs is a free online word processing program. You can access Google Docs from all devices and platforms, all you need is an Internet connection and a web browser. It works for both individual files and folders. You can also use the free templates available with Google docs.

c. Google gives you 15 GB of free cloud storage just when you sign up for the first time. You can upgrade it to more space if needed by paying some amount. This free space is shared between your mails, photos, data on your drive, etc., on all your Google apps.

d. Google Maps helps users navigate while driving, whether on interstate roads or within cities. It provides directions when the user enters a starting and a destination point. The current position of the user can be determined with the help of GPS (Global Positioning System) services provided by it. It also helps us find seats in a large stadium or navigate to our favourite store in a mall. It also lets us check the traffic by tapping the traffic option present in the app.

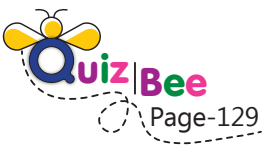
6. a. Arshiya should use Google Forms.

b. They can use Google Calendar with features such as:

- Event scheduling
- Notifications
- Sharing calendars

Isha

8. Cyber Security



1. Digital Footprint 2. Phishing

ASSESS YOURSELF

1.	a. (iii)	b. (iii)	c. (i)	d. (iii)	e. (ii)
2.	a. Phishing	b. Spamming	c. Software piracy	d. 2008	
3.	a. F	b. T	c. T	d. T	e. T

4. a. Hacking b. Spamming c. Intellectual Property Rights
   d. Cyber Crime e. Intellectual Property

5. a. The word 'cyber' denotes the culture of computers, information technology and virtual reality. The connection between interrelated computers all around the globe forms the cyber space and gives rise to the requirement of cyber security. It is the practice of protecting computers from malicious attacks. We need cyber security to protect cyber space from misuse and cyber-attacks.

   b. Spamming refers to the act of repeatedly sending unwanted e-mails called spams to a large number of recipients. These e-mails are used for commercial advertisements. These are also known as junk e-mails.

   Following are some tips to avoid spams:

   - Avoid sharing your e-mail id with everyone.
   - Set up filters to scan your e-mails and segregate spam or junk e-mails into a separate folder.
   - Never revert to any spam e-mail.

   c. Phishing is the illegal practice of obtaining sensitive information through e-mails. The criminals try to get information like user name, password and credit card details from us through e-mails. People with malicious intentions usually fake their identity and pose as a known contact or organisation.

   Following are some tips to avoid phishing:

   - Do not open e-mails without verifying the source.
   - Do not share your personal information via e-mails. It must be shared only via smartphone or a secure website.

   d. Digital footprints or digital shadow are the traceable activities that we leave behind after surfing the Internet. All the activities performed by us on the Internet are recorded, including:

   - All social media activities on Facebook, Twitter, Instagram, blogs, etc.
   - Uploaded photos and videos
   - Browsing history
   - E-subscription
   - Personal information
   - Played online games

   Digital footprints are permanent and can be used by law enforcement agencies to find out the details about the offenders.

6. a. Copying information without giving credit is known as plagiarism, which is unethical because it involves taking someone else's work and presenting it as your own.

   b. To verify whether the e-mail is a phishing attempt, you should:

   1. Check the sender's email address
   2. Avoid clicking on suspicious links
   3. Never share personal or account details through email.

1. BAT is coded as 2120
2. MOON → 13151514

9. Algorithmic Intelligence

Quiz Bee Page-138

Do it yourself.

Quiz Bee Page-138

1. b. 2. a. 3. b.

ASSESS YOURSELF

1. a. (iii) b. (i) c. (ii)
2. a. F b. F c. T d. F e. T
3. a. Information processing involves acquiring, storing, analysing, retrieving, and displaying data. Just like a computer, our brain acquires, processes, and stores information.
   b. An algorithm is a set of step-by-step instructions designed to solve a specific problem or complete a task. Think of it like a recipe; it tells you exactly what to do, in what order, to get a desired result.
   c. Computers use binary code, composed of 1s and 0s, to store and process data. These 1s and 0s represent electrical signals: ON for 1 and OFF for 0.
   d. The IF-THEN-ELSE conditional statement represents a fundamental logical construct. It facilitates decision-making by evaluating a Boolean expression. If the condition evaluates to "true," a specified action is executed; conversely, if "false," an alternative action is performed. This construct enables the implementation of branching logic within algorithmic processes.
   e. 1 START
      2 Input: Get the current day of the week. Store it in a variable called "today".

3. IF "today" is equal to "Sunday" THEN:
   - Print "Picnic"
4. ELSE:
   - Print "School"
5. END

4. a. If we had to live in a world without electricity:
   (i) Life would become much harder as most of our daily activities depend on electricity.
   (ii) Communication would become slow and limited to letters or landlines.
   (iii) Schools and offices would face difficulties due to the lack of computers and the internet.
   (iv) Transport systems like electric trains would stop working.
   b. Do it yourself.

{CODING ZONE}

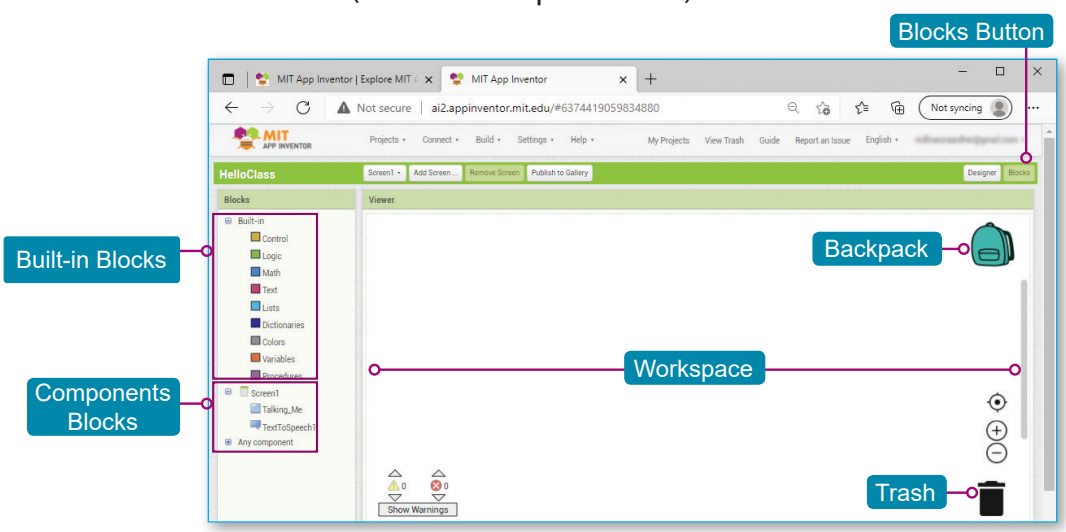
1. Do it yourself.

2. Do it yourself.

PERIODIC ASSESSMENT 3

(Based on chapters 7 to 9)

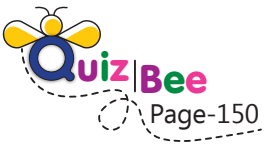
1.



2. a. Digital footprint is the traceable activity that we leave behind after surfing the Internet.
   b. Phishing is an illegal practice of obtaining sensitive information through fake or misleading e-mails.
   c. Cyber ethics are the rules that govern our actions when we use computers and the Internet.

d. Spamming refers to the act of repeatedly sending unwanted e-mails called spam to a large number of recipients.

10. Tokens and Data Types in Python



AND operator is logical operator that returns true if both operands are true.

ASSESS YOURSELF

1. a. (ii) b. (i) c. (iv) d. (iii) e. (iii)
2. a. Underscore (_) b. Logical c. Floor division d. Boolean
3. a. F b. T c. F d. T
4. a. An identifier is a sequence of characters taken from the Python character set. It refers to variables, functions and arrays.

   Keywords are the reserved words. They are predefined words. Keywords cannot be used as an identifier.

   b. Constants are fixed values that do not change during the execution of a program. Literals are the type of constant

   c. Not: It reverses the result, and returns false, if the result is true or vice versa.

   And: It returns true if both conditions are true.

   d. Data types are used to define the type of value a data can contain. Each variable in Python is associated with a data type. Each data type requires a different amount of memory and has some specific operations performed on it.

   Two examples of data types in Python are:

   1. Integer (int): Whole numbers, like 5, -10, or 0.

   2. String (str): Text, like "Hello", "Python", or "123".

   e. Addition assignment: It adds the right operand to the left operand and assigns the result to the left operand. x+=3 is equivalent to x = x+3, if x = 6, then the output will be 9.
5. a. 10 b. 2 c. False d. True
6. a. Division Operator

   b. Equality operator(==)

For comparing two numeric values for exact equality, case sensitivity does not apply, since numbers have no case (unlike strings).

{CODING ZONE}

1. a. c. e.
2. a. 11 b. False c. 8 d. 1
3. a. Missing closing quotation mark (") at the end.
   b. Print should be in lowercase → Python is case-sensitive.
   Missing parentheses (Python 3 requires them with print)
   c. Division by zero, which causes a ZeroDivisionError.
4. c.

11. Future of Artificial Intelligence

Quiz Bee
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Automated transportation will ensure that there are fewer accidents.

ASSESS YOURSELF

1. a. (iii) b. (i) c. (ii) d. (ii) e. (iii)
2. a. T b. T c. T d. F e. F
3. a. AI can revolutionise how traffic can be controlled and managed in cities. Congestion can be reduced by route selection, predictive alerts and route deviation.
   b. Smart highway is a type of road in which AI-enabled devices are used for monitoring the condition of the road, traffic levels and the speed of vehicles.
   c. A smart home is an AI-enabled home that lets us turn on our lights, play our our favourite music, or change the temperature of a room by tapping the app on our smartphones. It also has devices like Alexa to control the lighting and other devices in the home and to save energy, as well as AI-enabled security cameras. We can have our coffee ready when we wake up, automatically turn on and off ACs, lights, fans, etc.

d. AI-enabled CCTV can help in building surveillance systems to keep a check on potential criminal incidents and security of the residents. Social media intelligence platform with data from social media can predict potential activities that can affect safety.

4. a. AI-enabled CCTV surveillance systems

b. AI-powered chatbot or virtual assistant that uses natural language processing (NLP) to understand customer queries and provide instant, accurate responses 24/7.

{CODING ZONE}

1. Do it yourself.
2. 1 Start
   2 Input number_of_vehicles
   3 Input time_of_day (e.g., "8AM", "5PM")
   4 Check if number_of_vehicles > 100 and time_of_day is in peak hours (8AM–10AM or 5PM–7PM)
   If true, go to Step 5
   Else if number_of_vehicles > 60, go to Step 6
   Else, go to Step 7
   5 Print "High traffic congestion likely" → Go to Step 8
   6 Print "Moderate traffic" → Go to Step 8
   7 Print "Low traffic"
   8 End

PERIODIC ASSESSMENT 4

(Based on chapters 10 & 11)

1. a. True b. 100020 c. 10 5 20 d. True e. 20
2. a. Automated Transportation b. Traffic management
   c. Smart Highway d. Safety and Security
3. a. A syntax error will occur when these rules and regulations are violated.
   Logical errors are related to the logic of the program. These errors are also known as semantic errors. They cause the program to behave incorrectly.
   b. When someone tries to break into your home through the door or window, the motion sensor will send notifications to you. You will get instant alerts on your smartphones when your home is hit by fire, flood or any other disaster.

Test Sheet 2

(Based on chapters 7 to 11)

1. a. (ii) b. (ii) c. (iii) d. (iii)
   e. (iii) f. (i) g. (ii)
2. a. Google Drive b. Google Docs c. Digital footprints
   d. National cyber security policy, 2013 e. Constants f. Identifiers
3. a. F b. T c. T d. F
   e. T f. T
4. a. Palette pane: On the left, there is a palette pane from where we can select components like buttons, images, and other functions required for our app.

   b. Google apps offer several advantages:
   - No extra cost for hardware and software
   - No need to upgrade hardware and software
   - Secure and private Users' collaboration

   c. Hacking is the act of intruding into a computer system for harmful purposes by identifying the technical weak points of the security system using smart programming solutions.

   d. Computer ethics are rules that govern our actions when we use computers and the Internet.

   e. The value operated by the operator is called an operand.
5. a.
```
day = input("Enter the day: ")
if day == "Sunday":
   print("picnic")
else:
  print("School")
```

   b. Google introduced Google Sheets, a spreadsheet application, on 9 March 2006. It functions like any other spreadsheet tool, but as an online app, it offers much more than just standard spreadsheet features.

   When working with Google Sheets, you don't need to worry about saving your spreadsheet, as it is saved automatically. You can choose who to share your file with and grant them edit, comment, or view permissions. Additionally, you can protect specific data within your sheet so that those with access can only edit certain cells.

   c. IT Amendment act, 2008 aims to protect data privacy and information security. It validates digital signatures and contracts. According to this act, the owner of a given IP address will be held responsible for the content accessed or distributed through it.

d. These operators are used to assign value to a variable.

Operator	Name	Description	Example & Output (x=6)
=	Assignment	It assigns the value of the operand on the right side to the left side operand.	x = 5
+=	Addition assignment	It adds the right operand to the left operand and assigns the result to left operand. x+=3 is equivalent to x=x+3.	x += 3
–=	Subtraction assignment	It subtracts the right operand from the left operand and assigns the result to left operand. x–=3 is equivalent to x=x–3.	x –= 3
*=	Multiplication assignment	It multiplies the right operand with the left operand and assigns the result to left operand. x*=3 is equivalent to x=x*3.	x *= 3
/=	Division assignment	It divides the left operand with the right operand and assigns the result to left operand. x/=3 is equivalent to x=x/3.	x /= 3
%=	Remainder assignment	It takes the modulus of two operands and assigns the result to left operand. x%=3 is equivalent to x=x%3.	x %= 3
//=	Floor division assignment	It performs floor division on operators and assigns the value to the left operand. x//=3 is equivalent to x=x//3.	x //= 3
**=	Exponentiation assignment	It performs exponential (power) calculation on operators and assigns the value to the left operand. x**=3 is equivalent to x=x**3.	x **= 3

e. Errors are faults in a program. Errors prevent a program from executing accurately. There can be the following types of errors in a Python program:

Syntax errors: A syntax error will occur when these rules and regulations are violated.

Example: `print("Hello"  # Missing closing parenthesis`

Output: `SyntaxError: unexpected EOF while parsing`

Logical errors: As the name suggests, these errors are related to the logic of the program. These errors are also known as semantic errors. They cause the program to behave incorrectly. They are the most difficult errors to fix but they do not usually crash the program.

Example:

```
# Intending to calculate average
total = 30
count = 4
average = total * count  # Should be total / count
print(average)
```

Output: Wrong output, no error shown.

Run-time errors: Run-time errors in Python occur while the program is executing, causing it to crash or behave unexpectedly. These errors arise due to issues such as invalid operations, unavailable resources, or invalid inputs.

Example: `x = 5 / 0`

Output: `ZeroDivisionError: division by zero.`