

1. Number System

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
<p>A number system made up of 10 digits from 0 to 9, is known as decimal number system.</p> <p>The base of the decimal number system is 10. It is also known as the base-10 system.</p>	<p>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.</p> <p>The base of the hexadecimal number system is 16. It is also known as the base-16 system.</p>

- 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.

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

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) $(100110)_2 - (11001)_2 = (1101)_2$ (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. The colour code #0000FF uses the hexadecimal number system. In HTML, hexadecimal represents colours using combinations of numbers and letters to define precise red, green and blue colour values.
- c. The binary digit 1 represents the On state of a computer because computers use binary signals where 1 means On and 0 means Off.
- d. He is using the Binary Number System, and its base is 2, because it uses only the digits 0 and 1.
- e. The Hexadecimal Number System is used here by Sneha. Programmers prefer it because it represents colours compactly and is easier to read than long binary numbers.



2. Stills to Motion with Canva

ASSESS YOURSELF

1. a. (iii) b. (i) c. (ii) d. (iv) e. (ii)
2. a. Video Editing b. Trimming c. Animation d. Share e. Timeline
3. a. T b. T c. T d. F e. F
4. a. Video editing is the process of refining video clips by removing unnecessary parts and adding sound, text, effects and transitions.
b. Timeline shows a chronological order of video clips, audio tracks and transitions. The timeline allows trimming, reorganising or adjusting the duration of clips and elements.
c. Trimming allows you to shorten a video clip by removing unnecessary parts from the beginning or end.
d. To add sound effects or music to the video, perform the given steps:
 - 1 Click on the Add Audio button present in the timeline.
 - 2 Click on the See all link on the Audio section.
 - 3 Click on the desired audio file.
 - 4 Click on the Fade option.
 - 5 Drag the sliders of the Fade In and Fade out to make the audio clip start and end softly.
- b. To share a video, perform the given steps:
 - 1 Click on the Share button.
 - 2 Click the drop-down menu under the Access level section to set the access permissions.
 - 3 Select the desired option from the Can view, Can comment and Can edit options.
 - 4 Click the Copy link button to finalise sharing. Now, send the link with person whom you want to share the video.
5. a. Aman can add background music to his motivational video in Canva by uploading his own music by using the uploads button in the Object Panel.
b. Rahul can use the Animate tool to add animation effects to text and images and the Transitions tool to create smooth changes between video clips.
c. Meera should use the Preview (Play) button. Previewing helps check video flow, timing, sound, and effects before submission, allowing her to find and correct mistakes easily.
d. Sanya should use the Fade transition (or Dissolve transition). It makes scenes change smoothly instead of abruptly, giving the video a more natural and professional look.

- e. Ananya should use the Add Page (+) button. It inserts a new page or scene in the timeline, helping her create new slides without removing existing content.

3. Making Web Pages Alive

ASSESS YOURSELF

- (i)
 - (ii)
 - (iv)
 - (i)
 - (ii)
- MP3
 - OPACITY
 - CSS
 - ALT
 - SRC
- T
 - F
 - F
 - T
 - F
- <video> tag is used for inserting a video file in a web page.

b. A:VISITED: It is used to apply styles to visited links.

A:ACTIVE: It is used to apply styles to an active link. A link becomes active when the user clicks on it.

c. Internal linking connects sections within a web page. For example, a table of contents with links at the top allows readers to jump to sections, bypassing the need to scroll.

External linking connects your page to another, either on your local disk or the Internet. It directs visitors to additional resources on other sites, useful for sharing sources or references in blogs or research papers.

d. <!DOCTYPE HTML>

```
<HTML>
```

```
<HEAD>
```

```
  <TITLE>USING AUDIO TAG</TITLE>
```

```
</HEAD>
```

```
<BODY>
```

```
  <H2>WHAT IS ARTIFICIAL INTELLIGENCE?</H2>
```

```
  <P>ARTIFICIAL INTELLIGENCE IS THE ABILITY OF MACHINES TO SIMULATE  
  HUMAN INTELLIGENCE.</P>
```

```
  <AUDIO CONTROLS AUTOPLAY LOOP>
```

```
    <SOURCE SRC="AI.MP3" TYPE="AUDIO/MPEG">
```

```
    YOUR BROWSER DOES NOT SUPPORT THE AUDIO ELEMENT.
```

```
</AUDIO>
```



```
</BODY>
</HTML>
```

e. You can give rounded edges to an image using the CSS BORDER-RADIUS property.

```
<!DOCTYPE HTML>
<HTML>
<HEAD>
  <TITLE>FLAMINGO FACTS</TITLE>
</HEAD>
<BODY STYLE="BACKGROUND-COLOR: #F0F8FF;">
  <H1 STYLE="COLOR: #FF6347; TEXT-ALIGN: CENTER;">ALL ABOUT
  FLAMINGOS</H1>
  <H2 STYLE="COLOR: #4682B4; TEXT-ALIGN: CENTER;">THE GRACEFUL PINK
  BIRDS</H2>
  <!-- IMAGE WITH ROUNDED EDGES -->
  <IMG STYLE="BORDER: 5PX SOLID #FF6347; BORDER-RADIUS: 15PX;
  OPACITY: 0.7; WIDTH: 300PX;"
  SRC="BEAUTIFUL-FLAMINGOS-LAKE.JPG" ALT="FLAMINGO IMAGE">
  <P STYLE="COLOR: #2F4F4F; TEXT-ALIGN: CENTER;">
  FLAMINGOS ARE TALL, WADING BIRDS KNOWN FOR THEIR LONG LEGS,
  ELEGANT NECKS, AND DISTINCT PINK FEATHERS.
</P>
</BODY>
</HTML>
```

5. a. (i) To set the size of the image "scream.png" to 250 pixels wide and 400 pixels tall using CSS.

```
<!DOCTYPE HTML>
<HTML>
<HEAD>
  <TITLE>WEB PAGE WITH IMAGES</TITLE>
  <STYLE>
    IMG.SCREAM {
      WIDTH: 250PX;
      HEIGHT: 400PX;
    }
  </STYLE>
</HEAD>
<BODY>
  <IMG SRC="scream.png" ALT="Scream image" style="width: 250px; height: 400px;" />
</BODY>
</HTML>
```



```

        </STYLE>
</HEAD>
<BODY>
    <!-- IMAGE WITH DEFINED SIZE USING CSS -->
    <IMG SRC="SCREAM.PNG" ALT="SCREAM IMAGE" CLASS="SCREAM">
</BODY>
</HTML>

```

(ii) To add an image "smiley.gif".

```

<!DOCTYPE HTML>
<HTML>
<HEAD>
    <TITLE>WEB PAGE WITH IMAGES</TITLE>
</HEAD>
<BODY>
    <!-- ADDING SMILEY.GIF IMAGE -->
    <IMG SRC="SMILEY.GIF" ALT="SMILEY IMAGE">
</BODY>
</HTML>

```

- b. Ishaan needs internal linking. It connects sections within a web page.
- c. Aarav should use the target attribute value `_blank` to open the blog in a new browser tab.
- d. Maya should use an external link (absolute link) to connect her homepage to another website.
- e. Aditya should use the CSS opacity property (set to 0.5) with the `` tag.

4. Lists and Tables in HTML5

ASSESS YOURSELF

- | | | | | | |
|----|-----------------|------------|--------------|------------|--------|
| 1. | a. (iii) | b. (i) | c. (iv) | d. (ii) | e. (i) |
| 2. | a. Unordered | b. Integer | c. Table Row | d. Caption | |
| | e. BORDER-WIDTH | | | | |
| 3. | a. T | b. F | c. F | d. T | e. T |



4. a. A list is a collection of related items shown in pointed form. In HTML, lists present data in an organised and readable way. There are three types of lists: Ordered list, Unordered list and Description list.
- b. It is a shorthand property for three CSS properties: LIST-STYLE-TYPE, LIST-STYLE-IMAGE and LIST-STYLE-POSITION.
- c. The following are the advantages of using tables in HTML are:
- (i) Tables allow you to summarise content in one of the easiest ways.
 - (ii) They enable you to present data in a tabular format rather than in the default paragraph style.
- d. The HTML code to create a styled ordered list and table:

Program

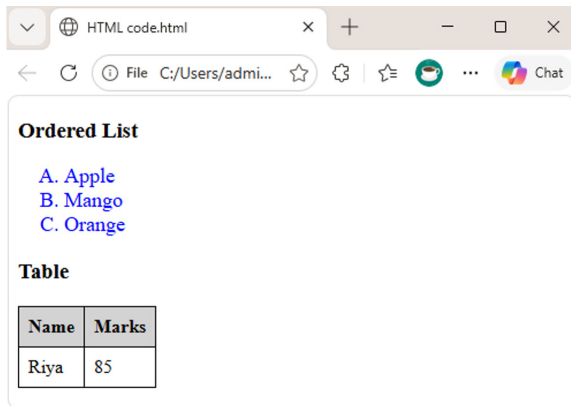
```
<!DOCTYPE html>
<html>
<head>
<style>
ol { color: blue; font-size: 18px; }
table, th, td {
    border: 1px solid black;
    border-collapse: collapse;
    padding: 8px;
}
th { background-color: lightgray; }
</style>
</head>
<body>
<h3>Ordered List</h3>
<ol type="A">
    <li>Apple</li>
    <li>Mango</li>
    <li>Orange</li>
</ol>
<h3>Table</h3>
<table>
<tr>
```



```

    <th>Name</th>
    <th>Marks</th>
</tr>
<tr>
    <td>Riya</td>
    <td>85</td>
</tr>
</table>
</body>
</html>

```



- e. Padding: The PADDING property sets space on all four sides in one declaration, using units like pixels or percentages.
- Width: The CSS WIDTH property specifies the width of the element's content area. 100% width will capture the complete width of the web page.
5. a. Arun should use an unordered list for listing ingredients and an ordered list for listing the steps.
- b. A restaurant should use <TABLE> tag along with <TH>, <TR> and <TD> to prepare menu card.
- c. Rohan should use the (ordered list) tag with the attributes start="3" and type="A" to begin numbering from 3 using uppercase letters.
- d. Dev should use a description list structured with these mandatory HTML tags:
- <dl> — description list container
 - <dt> — destination name (term)
 - <dd> — description of the destination
- e. Arjun should use the CSS padding property to add extra space around the content inside each table cell.



5. Google Apps

ASSESS YOURSELF

- (iii)
 - (iv)
 - (ii)
 - (i)
 - (iii)
- Syllabus
 - Broadcast
 - Arial
 - Google Translate
 - Drive
- F
 - T
 - T
 - F
 - T
- Google Forms
 - Google Drive
 - Google Slides
 - Gmail
 - Google Maps
- 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. Follow the given steps to upload a video on YouTube:

- 1 Click on the Create button.
- 2 Select the Upload Video option.
- 3 Click on the Select files button to upload the file.
- 4 Select the file that you want to upload.
- 5 Click on the Open button.
- 6 Enter the details of your video such as the Title.
- 7 Enter the Description.
- 8 Add your Playlist.
- 9 Click on Upload file.
- 10 Click on the Next button.

- In cloud computing, data is stored and accessed over the Internet rather than from the hard drive of a computer.
- 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
- c. Neha should use Google Docs, which allows writing and editing documents online, syncing automatically across devices and providing ready-made templates to create essays easily without starting from scratch.
- d. Meera should click the dotted square Google Apps icon, select Drive from the menu and Google Drive will open, allowing her to upload documents using the New or Upload option.
- e. Vikram should use Google Forms because it helps create online surveys, share links easily, collect responses automatically and analyse results instantly through charts and summaries for quick understanding.

6. Cyber Security

ASSESS YOURSELF

1. a. (iii) b. (iii) c. (i) d. (iii) e. (ii)
2. a. Phishing b. Government c. Plagiarism 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. Information and Technology Act, 2000 is also known as the Indian Cyber Act. It provides legal recognition to all e-transactions and aims to protect online privacy and curb online crimes.
- 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:
- (i) Check the sender's email address
 - (ii) Avoid clicking on suspicious links
 - (iii) Never share personal or account details through email.
- c. Ananya's artwork is protected by copyright. She can safeguard it legally by adding a copyright notice, watermark, or registering her work and reporting unauthorised use online.
- d. Karan might have unknowingly committed software piracy, a cybercrime involving illegal downloading or using unlicensed software, which can also introduce malware causing computer malfunction.
- e. Rahul should install reliable antivirus software and keep his system updated regularly. He should also use strong passwords and avoid downloading files or software from unknown websites.

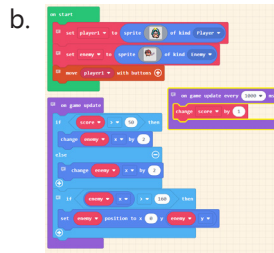
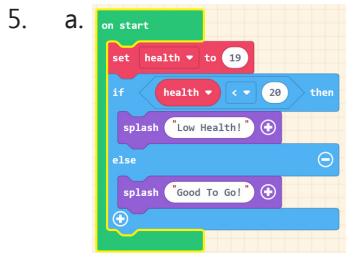
7. More on MakeCode Arcade

ASSESS YOURSELF

- | | | | |
|---------|---------|---------|---------|
| a. (ii) | b. (iv) | c. (ii) | d. (iv) |
|---------|---------|---------|---------|
- | | | | |
|-------------|-----------|-------------------|---------|
| a. Variable | b. Letter | c. Initialisation | d. Game |
|-------------|-----------|-------------------|---------|
- | | | | |
|------|------|------|------|
| a. F | b. T | c. T | d. T |
|------|------|------|------|
- a. A keyword is a predefined word in any programming language.

b. Math blocks are used to perform various mathematical operations and computations in your games and projects, like addition, subtraction, multiplication and division.

- c. There are two conditional blocks in MakeCode Arcade, which are as follows:
- (i) if-then
 - (ii) if-then-else
- d. (i) 'set to' block is used to assign a value to a variable.
- (ii) 'if-then' block is used to allow us to execute code only if a certain condition is true.
 - (iii) 'boolean false' is used to set the value as false.



- c. Riya is using a variable. Its main parts are the variable name, stored value and data type. Variables store information that can change during program execution.
- d. This happens because programming languages are case-sensitive. "Lives" and "lives" are treated as different variable names since uppercase and lowercase letters are considered separate characters.
- e. Kabir should use the Math block category. It allows calculations like addition, so he can add 10 points to the score whenever the car crosses the finish line.

8. More on Python

ASSESS YOURSELF

1. a. (i) b. (iv) c. (iv) d. (iii) e. (iii)
2. a. assignment b. operators c. true d. false e. else
3. a. F b. F c. T d. F e. F
4. a. A string is a sequence of one or more characters put in single quotes, double quotes or triple quotes which are used to represent text-based information.
- b. A Python program to check whether a given number is positive:


```
number = float(input("Enter a number: "))
# Check if the number is positive
```



```
if number > 0:  
    print("The number is positive.")
```

Output

Enter a number: 6

The number is positive.

c. Following are the relational operators provided by Python:

- == Equal to
- != Not equal
- > Greater than
- < Less than
- >= Greater than or equal to
- <= Less than or equal to

For example, == operator: It checks if the values of two operands are equal or not. If yes, then the condition becomes true.

Program: print (5 == 5)

Output: True

d. Comments in Python can be used to explain parts of the code. It can also be used to hide the code as well. Comments enable us to understand the way a program works. In python, any statement starting with # symbol is known as a comment.

Python supports two types of comments: Single line comment and Multiline comment.

e. (i) Float data types represent numbers that contain a decimal point. For example, 0.6, -3.257.
(ii) Boolean is a data type with two built in values: True or False. They are used for logical evaluation.

f. (i) AND returns true, if both operands are true.

Example: (2 < 5) and (2 < 10). Output: TRUE.

OR returns true, if one of the operands is true.

Example: (2 < 5) and (2 < 10). Output: TRUE.

(ii) Modulus Operator divides left hand operand by right hand operand and returns remainder.

Example: 7 % 3. Output: 1

Division Operator divides left hand operand by right hand operand.

Example: 7 / 3. Output: 2.33

g. Decision making in Python is done by called conditional statements which decide the flow of program execution.

5. a. Shweta can use conditional statements (decision-making statements) such as if, if-else, or elif. These statements execute specific instructions based on whether a given condition is true or false.

b. Radhika should use the integer (int) data type because it stores whole numbers without decimal values and allows arithmetic operations like addition and subtraction efficiently.



- c. The program uses the Boolean (bool) data type. It returns only two internal values: True or False, representing whether the student has passed or failed.
- d. These lines are called comments. They explain the code, improve readability, help programmers understand logic easily and do not affect the execution of the Python program.
- e. The concept is operator precedence. It determines the order in which operations are performed in an expression, giving multiplication higher priority than addition during execution.

9. Domains of AI

ASSESS YOURSELF

1. a. (i) b. (iii) c. (iii) d. (ii) e. (i)
2. a. Problem-solving b. Chatbots c. Data d. Face recognition
e. Healthcare
3. a. F b. F c. T d. T e. F
4. a. The three domains of AI are Natural Language Processing, Data Science and Computer Vision.
b. Data refers to a collection of facts and information in various forms, such as numbers, text, sound, or images. It can be measured, collected, and analysed, often visualised with graphs.
c. Natural Language Processing (NLP) is a field of AI that focuses on the interaction between computers and human language, enabling machines to understand, interpret, and generate human language.
d. Data science is the study of data that helps you gather, organise and understand it to find practical solutions. It's used in everyday life, for things like tracking fitness steps, video likes or report card marks.

Here are some examples of data science:

- Healthcare: Data science helps predict disease outbreaks by analysing past data, environmental factors and population information.
 - Finance: In finance, data science helps with credit scoring. By using machine learning, we analyse a person's financial history, job status and income to predict how likely they are to repay loans.
- e. Structured data is organised in a specific format, making it easy to search and analyse, often found in relational databases. Unstructured data does not follow a specific format, including text documents, images and videos, requiring extra processing to organise and analyse.



5.
 - a. Madhu should use Data Science, as it helps in tracking data, identifying patterns, and making informed predictions.
 - b. Kavya should use Optical Character Recognition (OCR).
 - c. This is structured data because information is stored in a fixed table format. It is useful as it can be easily searched, organised, filtered and analysed quickly.
 - d. The technology is Natural Language Processing (NLP). It enables the chatbot to understand human language, interpret questions and generate meaningful responses that improve through learning over time.
 - e. The technology is facial recognition. It uses artificial intelligence and biometric data to analyse facial features and identify the owner, allowing the smartphone to unlock securely and automatically.

