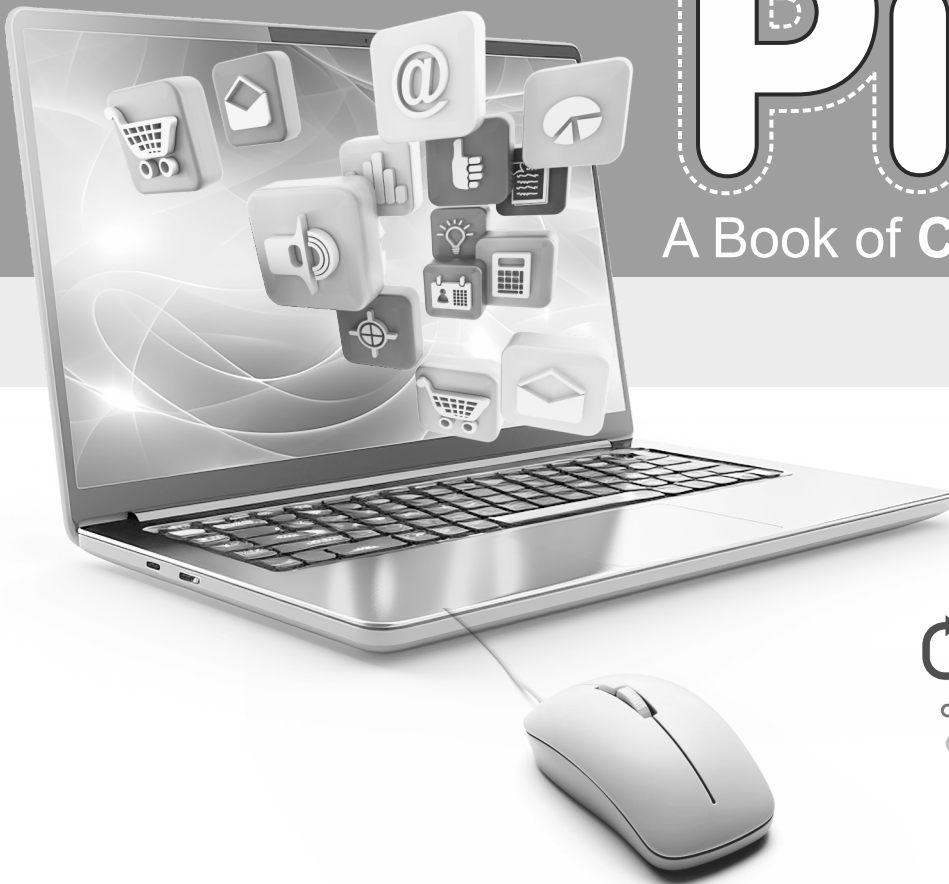# Pixel

A Book of **Computer Science**

7

1.   Number System

Assessment Zone

A.   1. (c)   2. (b)   3. (c)   4. (a)   5. (b)

B.   1. F   2. T   3. T   4. F   5. F

C.   1. digits   2. binary   3. 10   4. 8   5. 0 to 9, A to F

D.   1. The smallest unit of data that a computer represents.

       2. When eight bits are grouped together as a unit, it form a byte.

       3. Nibble is a collection of 4 bits.

E.   1. Number system is a way to represent numbers in a computer system. Every value that you are giving to/getting from computer memory has a defined number system.

       There are two types of number systems :

         (i) Non-positional number system

         (ii) Positional number system

       2. To convert from binary to decimal equivalent, follow the given steps :

       Step 1: Note down the place values of each digit.

       Step 2: Multiply each digit with its place value.

       Step 3: Add the product to get back the number.

       For example : Convert $(1001010)_2$ to its decimal equivalent.

$$1001010 = 1 \times 2^6 + 0 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$$

$$= 64 + 0 + 0 + 8 + 0 + 2 + 0$$

$$= 74 \text{ (Therefore, the decimal value is 74)}$$

F.   They use stones, pebbles or sticks.

❏

2.   GIMP : Introduction

Assessment Zone

A.   1. (b)   2. (c)   3. (b)   4. (c)   5. (a)

       6. (b)   7. (b)

B.   1. F   2. T   3. T   4. F   5. T

C.   1. GIMP   2. Fuzzy Select   3. Scissors Select

       4. specific   5. Filters

D.   1. This tool is used to change the magnification of the desired part of an image.

       2. This tool is used to cut the desired part of an image.

3. This tool is used to copy information from one area of an image to another.

E. 1. GIMP toolbox displays a variety of icons, each one representing an image-editing tool.

2. Changing the screen size, changing the print size, changing the canvas size of an image.

3. Color Balance tool is used to change the amount of specific colors in an image.

F. 1. GIMP is an acronym for GNU Image Manipulation Program. It is an open source program that allows you to create, modify, combine and optimise digital images.

The various features of GIMP are :

(i) GIMP provides various selection tools to edit specific pixels in the image.

(ii) GIMP Paintbrush, Airbrush and Pencil tools are used to apply colors or patterns to our images after selecting their pixels.

(iii) We can brighten, darken and change the shades of colors in parts of our image with GIMP Dodge, Burn and similar tools.

(iv) We can easily add drop shadows, frame border, 3D shading, etc. to our images.

2. Filters can help us correct defects in our image or enable us to turn a photograph into something that resembles an impressionist painting. GIMP comes with many filters. Filters in RGB Noise add or remove a texture resembling that of sand in our image.

G. Crop tool.

❏

3. GIMP : Working with Layers

Assessment Zone

A. 1. (b) 2. (a) 3. (a) 4. (b) 5. (a)

B. 1. T 2. F 3. T 4. F 5. T

C. 1. Layers 2. Layers Tab 3. opacity 4. Flattening
5. blending

D. 1. This mode dissolves the upper layer into the layer beneath it by drawing a random pattern of pixels.

2. This mode is used to make the edges softer.

3. This mode is used for darken image.

E. 1. The Layers dialog panel appears on the top right-side of GIMP window, where we can work with Layers.
2. Lock Pixels is a toggle key which prevents painting on the selected layer when it is switched on.
3. Eye option in layers dialog panel is used to hide/unhide an image.
4. By duplicating a layer, we can manipulate elements in an image while keeping a copy of their original state.
5. Reordering a Layer change the stacking order of layers to move elements forward or backward in our image.

F. 1. Layers are the key components to work with graphic objects. These are used to work on individual parts of an image without affecting the other parts. A GIMP image consists of multiple layers, with each layer containing different objects in the image.
2. Opacity is used to change the transparency of a selected layer, where 0 is total transparency and 100 is no transparency.
3. We can use GIMP blending modes to specify how pixels in a layer should blend with the layers below. We can blend layers to create all kinds of visual effects in our photos. GIMP has **twenty-one** blending modes. Selecting a blending mode changes the appearance of the layer or image, based on the layer or layers beneath it.

G. Flattening Layer.

❏

4.   Internet : Ethics and Safeguard

Assessment Zone

A. 1. (b)　　　2. (b)　　　3. (a)　　　4. (a)　　　5. (c)
B. 1. T　　　2. T　　　3. T　　　4. F　　　5. F
C. 1. Virus　　　　　2. Keylogger　　　　3. Hacker
　　4. Digital Footprint　5. strong
D. 1. Cyberbullying includes sending or forwarding threatening messages, posting embarrassing or altered pictures of someone without his or her permission.
2. Social engineering is a term used for gaining unauthorized access or obtaining confidential information.
E. 1. By creating strong password and change it frequently. Our password should be at least six characters long and include at least one number, letter (combination of upper and lower cases) and special character

(@, *, &, !, etc.). Do not use our date of birth, name or any sensitive information as our password. It is strongly advised that we use different passwords for different accounts.

2. We should not save password for our account in a particular website as anyone can access our account from that website.

3. Parents and teachers should advise children to play only those online games which are suitable for their age. Parents should be an active part of the children's online life. At the same time, they should gain their trust as far as the use of Internet is concerned.

F. Cyberbullying.

❏

5. HTML5 : Introduction

Assessment Zone

A. 1. (b)   2. (a)   3. (a)   4. (b)   5. (a)

B. 1. F   2. T   3. T   4. F   5. T

C. 1. Tim Berners Lee   2. compatible   3. angular
     4. HTML Entity   5. Text Edit

D. 1. HTML is a language used to create web pages.
     2. Semantic tags enable us to describe the different parts of a web page.
     3. DOCTYPE is a declaration that specifies document is written in HTML5.
     4. Attributes offers option for the specific tag. For example, SIZE is an attribute of <HR> tag.

E. 1. The main features of HTML are :
     (i) HTML is not a case-sensitive language. This means that HTML5 commands can either be written in lower case or in upper case.
     (ii) Spaces and tabs can be used anywhere in the document because it does not affect the appearance of the document.
     (iii) HTML document is saved with **.htm** or **.html** file extension.
     (iv) HTML document is written in text editors like Notepad, Sublime Text and Gedit and word processors like WordPad, MS-Word and Writer.
     2. We will avoid syntax error while writing an HTML code by placing opening and closing tags at appropriate location.

F. Open the web browser and press Ctrl + U. A new tab displays the HTML code.

❏

6.   HTML5 : Creating Web Pages Using CSS

Assessment Zone

A.   1. (b)   2. (b)   3. (c)   4. (c)   5. (b)

B.   1. F   2. F   3. T   4. F   5. T

C.   1. DOCTYPE   2.
      3. Inline   4. <H1>, <H6>
   5. <LINK>

D.   1. The DOCTYPE declaration at the beginning of our page specifies that the document is written in HTML5.
   2.
 tag insert a line break to instruct the browser to break the text and go to a new line.
   3. We can define style sheet in HTML document in three ways : Internal, Inline and External.

E.   1. **DOCTYPE DECLARATION :** The DOCTYPE declaration at the beginning of our page specifies that the document is written in HTML5. In HTML5, the DOCTYPE declaration is required.
   HTML TAGS : The **<html>** and **</html>** tags appear at the beginning and end of an HTML document. When a browser sees these tags, it knows that anything within the two tags defines a web page.
   DOCUMENT HEAD : We use the head of an HTML document to add expressive information to our web page. The document head tags, **<head>** and **</head>**, immediately follow the opening <html> tag. The document head contains information that does not appear in the browser window, including title information, metadata and references to scripts and style sheets.
   DOCUMENT TITLE : The **<title>** and **</title>** tags define a page title and appear inside the document head.
   BODY TAG : The visible content that makes up our web page, including paragraphs, lists, tables, images and video, resides in the body of our HTML document.
   2. **Metadata** tag is used to include extra descriptive information that does not appear in the browser window. It can include a page description, author and copyright information, keywords and more.

F.   He should save the file with .htm or .html extension.

❏

⑤

7. HTML5 : Images, Links and Table

A. 1. (a) 2. (b) 3. (c) 4. (a) 5. (a)

B. 1. T 2. F 3. T 4. F 5. F

C. 1. <IMG> 2. absolute, relative
3. tables 4. Merging
5. cell padding

D. 1. Cell padding defines the designated amount of space between the cell contents and the cell borders.
2. Cell spacing defines the designated amount of space between the cell borders.
3. Anchor tag is used to define the link to another page.

E. 1. To make the webpages interactive and attractive.
2. SRC in image tag is the source of image file. It specifies the URL of the image.
3. Table enables us to present large volume of data in rows and columns.

F. 1. We can create a link to an image so that the visitor can click on that image to display the link. We can also create a link that can take visitors to an image. This is helpful in case we wish to display a large number of images on our page.
   Syntax : <A HREF = "https://en.wikipedia.org/Computer"> </A>
2. The building blocks of HTML tables are the **<TABLE>**, **<TR>**, **<TH>** and **<TD>** tags.
   The <TABLE> tag defines the table itself.
   The <TR> tag defines a table row.
   The <TH> tag defines a table header.
   The <TD> tag defines the table data or cell content.
3. **Spanning cells**, also called **merging cells**, are mainly used to display a title across the top or down side of table.

G. Do it yourself.

❏

8. Python : Conditional Control Structures and Turtle

Assessment Zone

A.   1. (c)   2. (c)   3. (b)   4. (b)

B.   1. T   2. T   3. T   4. F   5. T

C.   1. statements, indentation   2. if, condition, colon
      3. Nesting   4. Forward function
      5. radius

D.   1. Assignment operator is used to assign a specific value to the variable.
      2. Logical operator perform logical AND, logical OR and logical NOT operations.

E.   1. Indentation is a one-tab space used to arrange code.
      2. Control structures are used to control or change the flow of execution.
      3. We use if-elif-else statement for multipath decisions.

F.   1. The if-else statement is an extension of the simple **if** statement. The if statement will check the condition; if it is **True,** the if block statement is executed, if the condition is **False** then it executes **else** block statement.
      Syntax:
      if condition :
      Body of if
      else :
      Body of else
      2. **A compound statement** contains one or more statements and controls their execution. A compound statement has one or more **clauses** aligned at the same **indentation**. Each clause has a **header** starting with a keyword and ending with a colon (:), followed by a body, which is a sequence of one or more statements.

G.   Conditional Control Structure.

❏

9.   Chatbot

Assessment Zone

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

B.   1. F   2. F   3. T   4. F   5. T

C. 1. NLP   2. Script   3. Cleverbot 4. Watson Assistance
    5. Google Now

D. 1. Chatbot allows humans to interact with technology using a variety of input methods such as **voice** and/or **text**.

    2. EVA (Electronic Virtual Assistant) is a banking chatbot from HDFC Bank that uses an Artificial Intelligence algorithm and NLP to help us with our banking queries.

    3. NLP is the core of chatbot which is used to split the user input into sentences and words.

    4. Kuki is the world's most popular English language social chatbot having exchanged over one billion messages with an estimated 25 million users on the web, social media and various messaging applications.

E. 1. (i) Chatbots are flexible and learn from every human interaction.

     (ii) Chatbots can easily handle the customer queries without any human assistance.

   (iii) Chatbots allows humans to interact with technology.

    2. Click on **Get started** button. Create your Acquainted account by filling the form. If you have an account already, click on **Login**. Fill your credentials and click on **Register**. Once the registration process completes, Acquainted page will appear. Click on **Create conversation**. The **Create conversation page** will appear.

    3. A user interacts with a chatbot using natural language which can be either textual or verbal, by using various chat mediums such as mobile apps, website chat windows and social messaging services across platforms like Facebook and Twitter. The chatbot then analyses the text input, considers the best response and delivers that back to the user.

F. EVA (Electronic Virtual Assistant). ❏

10. AI for Sustainable Development Goals

Assessment Zone

A. 1. (c)   2. (c)   3. (b)   4. (a)   5. (c)

B. 1. T   2. F   3. T   4. T   5. F

C. 1. pillars of sustainability   2. satellite imagery

    3. education   4. optimize

    5. dark-skinned

D. 1. The three elements of sustainable development Social, Economic and Environmental are interconnected and also known as the **pillars of sustainability**.

2. The main issues covered under the United Nations General Assembly in 2015 are :

    (i) Eradicate poverty across the world.

    (ii) Improve quality education and promote lifelong learning opportunities for all.

    (iii) Promoting practices for better consumption and production of resources.

3. The problem of inclusion is found in most of AI systems, showing signs of systematic recism and bias. This happens because the data used for training are already tainted with existing societal biases.

E. SDG IV (Quality Education). ❏

Half-Yearly Model Test Paper

A. 1. (a) 2. (c) 3. (b) 4. (b) 5. (b)
6. (a) 7. (c) 8. (a) 9. (b) 10. (a)

B. 1. F 2. F 3. F 4. T 5. T
6. T 7. F 8. T 9. T 10. F

C. 1. digits 2. 8 3. GIMP 4. Fuzzy Select
5. Layers 6. Layers tab 7. Virus
8. Tim Berners Lee

D. 1. **Nibble :** A nibble is a collection of bits on a 4-bit boundary.

2. **Zoom tool :** We can change the magnification of the desired part of an image with the help of the Zoom tool. It helps us see small details in an image.

3. **Clone tool :** This tool copies information from one area of an image to another. We can also clean up small flaws or erase elements in our image with the help of Clone tool.

4. **Dissolve :** This mode dissolves the upper layer into the layer beneath it by drawing a random pattern of pixels.

5. **Phishing :** Phishing is a scam in which we receive an official or legitimate-looking email message.

E. Do it yourself.

F. 1. Number system is a way to represent numbers in a computer system. Every value that you are giving to/getting from computer memory has a defined number system.

There are two types of number systems :
  (i) Non-positional number system
 (ii) Positional number system

2. GIMP toolbox displays a variety of icons, each one representing an image-editing tool.

3. Changing the screen size, changing the print size, changing the canvas size of an image.

4. The Layers dialog panel appears on the top right-side of GIMP window, where we can work with Layers.

5. We can use GIMP blending modes to specify how pixels in a layer should blend with the layers below. We can blend layers to create all kinds of visual effects in our photos. GIMP has **twenty-one** blending modes. Selecting a blending mode changes the appearance of the layer or image, based on the layer or layers beneath it.

6. Cybercrimes are those instances when a person illegally accesses any computer for malicious reasons.

7. HTML is a language used to create web pages.   ❏

Annual Model Test Paper

A. 1. (b)   2. (b)   3. (a)   4. (b)   5. (c)
    6. (a)   7. (c)   8. (c)

B. 1. F   2. F   3. T   4. F   5. F
    6. T   7. T   8. T   9. F   10. F

C. 1. DOCTYPE   2.
      3. absolute or relative
    4. <IMG>   5. Nesting   6. statements, indentation   7. optimize
    8. dark-skinned

D. 1. **Internal style sheet :** An internal style sheet is used to define a style for a single HTML page.

    2. **Cell spacing :** Cell spacing is used to increase to border size or distance between cells.

    3. **Cell padding :** Cell padding is used to add space between the border and the contents of a cell.

    4. **Chatbot :** One of the most interactive applications of a computer is chatbot. A chatbot allows humans to interact with technology using a variety of input methods such as voice and/or text.

    5. **Operator :** Operators are the special symbols that carry out arithmetic and logical computations.

    6. **Turtle :** Turtle is a pre-installed library of Python which is used to create shapes in attractive manner.

7. **GIGO :** In computer science, Garbage In, Garbage Out or GIGO implies that accuracy of output would depend upon the accuracy of input given to the computer.

E. 1. The DOCTYPE declaration at the beginning of your page specifies that the document is written in HTML5.

2. To make the webpages interactive and attractive.

3. SRC in image tag is the source of image file. It specifies the URL of the image.

4. **Border :** Border attribute specifies the width of the border of the table.

   Cell padding : Cell padding attribute specifies the space between the cell wall and the cell content.

   Cell spacing : Cell spacing attribute specifies the space between two cells.

5. (i) Chatbots are flexible and learn from every human interaction.

   (ii) Chatbots can easily handle the customer queries without any human assistance.

   (iii) Chatbots allows humans to interact with technology.

6. Control structures are used to control or change the flow of execution.

7. The main issues covered under the United Nations General Assembly in 2015 are :

   (i) Eradicate poverty across the world.

   (ii) Improve quality education and promote lifelong learning opportunities for all.

   (iii) Promoting practices for better consumption and production of resources.

8. The problem of inclusion is found in most of AI systems, showing signs of systematic recism and bias. This happens because the data used for training are already tainted with existing societal biases.

❏