

1. Networks Around Us

ASSESS YOURSELF

- (i)
 - (ii)
 - (ii)
 - (iii)
 - (ii)
- F
 - F
 - T
 - T
 - T
- Gateway
 - SMTP
 - Star
 - Guided
 - CAN
- Network topology describes the physical or logical layout of the network, that is, how all the components (such as computers, cables and switches) are interconnected to each other.
 - HTTP is used to ensure the smooth transfer of web pages between a server and browser. On the other hand, HTTPS encrypts the communication between the browser and the server.
 - In a Client/Server network, clients access resources from a central server. The server is responsible for managing all the resources such as files, directories, printers, etc.
 - Network bandwidth means the amount of data that can be transmitted across a network in a given time, usually measured per second.
 - A transmission medium is the path or channel through which data travels from one device to another in a network. It is essential for determining the speed, quality, and reliability of the data transfer.
- In a wired network, a switch or hub should be used to link several computers together. A switch is preferred over a hub as it is more efficient in managing data transmission.
 - The most appropriate topology for this type of configuration would be star topology.
 - The hospital should use a Gateway to share the data with the research institute.
 - A Router should be used. A router will help route the data packets correctly between different Wi-Fi networks in different classrooms.
 - The wireless mouse is communicating with the computer through radio frequency (RF) or Bluetooth signals. These signals allow the movement of the cursor on the screen as the mouse is moved.
 - This is an example of a Personal Area Network (PAN). A PAN is a small network used to connect devices within close proximity, typically within the same room or table.

2. Introduction to Affinity by Canva

ASSESS YOURSELF

1. a. (i) b. (iii) c. (iv) d. (iii) e. (ii)
2. a. T b. F c. T d. F e. T
3. a. Boolean b. Snapping c. Hide, Show d. Invisible e. Filters
4. a. To create a new document, follow these steps:
 - 1 Click on File menu from the Menu bar.
 - 2 Select New option from the dropdown menu. A dialog box will appear.
 - 3 Choose your desired settings, such as document dimensions, resolution and color space, based on your project requirements.
 - 4 Click the Create Document button to generate the new file.
- b. The two components of Pixel Studio are:
 - Tools Panel: The Tools Panel is located on the left side of the workspace and provides quick access to the most commonly used tools for editing, painting, and creating. Provides access to a variety of editing tools, which vary depending on the selected Studio.
 - Menu Bar: It provides access to various commands and options for file management and other workspace settings.
- c. In real life, a ruler is a physical tool used to measure the length of an object or to draw straight lines. A grid is a structure of intersecting lines, nodes, or columns and rows used to organise, distribute or connect resources.
- d. To duplicate a layer, follow the given steps:
 - 1 Click on the layer you wish to copy to select it.
 - 2 Right-click on the selected layer.
 - 3 Choose Duplicate option from the context menu.
- e. (i) Crop Tool (ii) Inpainting Brush Tool (iii) Clone Brush Tool
(iv) View Tool
5. a. You should use the Clone Brush Tool to remove the unwanted object by copying a nearby part of the image.
- b. Kiran can use the Elliptical Marquee Tool along with the Crop Tool to select and crop the circular top layer of the cake.
- c. Rohan can use the Move Tool to reposition the shape to the right side of the image.



- d. Reshma can apply a filter or effect using the Filter Brush Tool to create a soft glow effect on the shape.
- e. Imran should go to the Layers panel, select the layer and rename it by typing Logo.

3. Cloud Computing

ASSESS YOURSELF

1. a. (ii) b. (ii) c. (iv) d. (ii) e. (ii)
2. a. T b. T c. F d. F e. F
3. a. Demand b. Cloud computing c. SkyDrive d. Public cloud
e. Community cloud
4. a. Cloud Storage b. Four c. Hybrid Cloud d. Apple e. OneDrive
5. a. Three benefits of cloud computing are:
 - (i) Easy Accessibility: Cloud services are available and accessible globally to everyone who has a computer or any device with an Internet connection. No specialised hardware or software is required.
 - (ii) Cost Effective: One has to pay minimal to no subscription charges to avail the services. It saves us from buying expensive specialised hardware or software.
 - (iii) Flexibility: The services provided by cloud computing are available 24 hours a day and seven days a week, and can also allow us to increase and decrease computing needs, hence, providing users with the flexibility to work as per their requirements.
- b. Google Drive is a cloud storage facility offered by Google. This service was launched by Google in April, 2012. Google Drive allows users to store files and data on the cloud. These files can be synced across devices and shared with other users. It is part of cloud computing services. Google Drive offers 15 GB of free storage, which can be upgraded to 100 GB, 1 TB or higher through monthly payments.
- c. To share a file with others on OneDrive, follow the given steps:
 - 1 Select the file that you want to share.
 - 2 Click on the Share button.
 - 3 Enter the email address of the people with whom you want to share your file.
 - 4 Choose the level of access.
 - 5 Click on the Send button.
- d. To upload files or folder on OneDrive, follow the given steps:
 - 1 Click on the Add new button.
 - 2 Select the Files upload or Folder upload option.

3. Navigate the location where the file or folder is stored.
 4. Select the file or folder which you want to upload.
 5. Click on the Open button.
- e. (i) Public cloud: A public cloud is owned by a third-party service provider (any organisation) whose services are easily accessible to the general public. The organisation sells its services to the general public and other organisations. To ensure that no resources provided by them are wasted, the users are supposed to pay for what they use.
- (ii) Private cloud: A private cloud is owned by a single company and allows its services to be accessed only within the company's firewall. It is not meant for the general public. This is best suited for companies with dynamic computing needs where they can maintain control over the cloud environment.
- (iii) Front end: The front end includes the users/clients who access the data via the Internet. The front end includes computers, user interfaces, and all the means required to access the cloud servers.
- (iv) Back end: Back end consists of the cloud computing infrastructure maintained by the cloud service provider. The back end includes various applications and the dedicated servers for each program. This gap between the client and the cloud is then bridged by the Internet.
6. a. The most essential ingredient of the cloud computing is the Internet.
- b. Ravi must select the folder, click Share, enter classmates' email addresses, choose access rights, and click Send.
- c. Sangeeta can use cloud storage to store her presentation and access it from any device.
- d. Sumit is looking for the OneDrive icon in his Yahoo account, but OneDrive is a Microsoft service, not linked to Yahoo.
- e. The company should choose a Private Cloud to ensure compliance with strict data storage regulations.

4. JavaScript for Beginners

ASSESS YOURSELF

1. a. (ii) b. (iv) c. (ii) d. (i) e. (iii)
2. a. F b. F c. T d. T e. F
3. a. Internal JavaScript b. Comments c. Variable d. Confirm
e. Web Browser
4. a. A block of code created specifically to carry out a specific task is referred to as a JavaScript function.



- b. JavaScript popup boxes are used to interact with users by displaying messages or requesting input. There are three main types of popup boxes: Alert Box, Confirm Box, and Prompt Box.
 - c. An expression is a meaningful combination of variables, values and operators which can be evaluated and simplified to a single result.
 - d. Comments are instructions that are not executed by the interpreter. JavaScript code may also include comments for the purpose of documentation and readability.
 - e. The steps for setting up JavaScript in a web browser:
 - 1 Click on the Settings and more button at the top right of the Microsoft Edge window.
 - 2 Select the Settings option from the drop-down list.
 - 3 Select the Privacy, search and services option in the left pane.
 - 4 Click on the Site permissions option in the right pane.
 - 5 Click on the All Permissions option in the right pane.
 - 6 Click on the JavaScript option.
 - 7 Toggle it to Allowed.
- 5.
- a. Logical AND (&&) operator.
 - b. The prompt() popup.
 - c. The web developer should place the JavaScript code within the <script> tags in the HTML document. The <script> tags should be placed either in the <head> section or just before the closing </body> tag.
 - d. If the user clicks 'Cancel' in the prompt box, null is returned. This indicates that no data was entered.
 - e. The website will use a confirm popup box to notify users about unsaved changes. The confirm box will show "OK" and "Cancel" buttons, allowing users to confirm or cancel the action.

5. Emerging Trends

ASSESS YOURSELF

1. a. (ii) b. (i) c. (iii) d. (ii) e. (i)
2. a. Software robots b. Blocks c. Digital d. Virtually
e. Internet of things (IoT)
3. a. T b. F c. T d. T e. F
4. a. The key features of 5G include faster speeds, lower latency, increased connectivity and enhanced reliability.

- b. Augmented Reality (AR) is a technology that adds digital information, like images, sounds or videos, to the real world. Virtual Reality (VR) creates an entirely digital environment that you can explore and interact with.
 - c. 3D printing in healthcare is used to create prosthetics, custom implants, and even organ models for surgery planning.
 - d. Bioinformatics helps in fields like medicine and agriculture by using computational tools and algorithms to study biological data, such as DNA sequences, protein structures, and gene expression. This helps to understand complex biological systems and solve problems in these fields.
 - e. Cloud computing refers to the use of computing services—such as storage, processing power and software—available over the Internet. Two examples of cloud-based services are: Google Drive and Dropbox.
- 5.
- a. Nikhil should use 3D printing to design a model and to quickly create prototypes.
 - b. Google Drive or Microsoft OneDrive are cloud-based platforms that would be best for sharing files and working together in real time.
 - c. The process being used here is 3D Printing. This allows for the creation of complex, non-traditional designs that cannot be made using traditional jewellery-making methods.
 - d. To enhance the gaming experience with virtual characters and objects in a real-world setting, you would use Augmented Reality (AR) technology.
 - e. Quantum computers work differently from regular computers by using quantum bits or qubits, which can exist in multiple states at once (superposition) and can be entangled with each other, allowing them to solve certain problems much faster than classical computers.

6. Advanced MakeCode Arcade

ASSESS YOURSELF

1. a. (iv) b. (iv) c. (ii) d. (ii) e. (iii)
2. a. Loop b. While c. Forever d. Break e. Function
3. a. T b. F c. T d. F e. F
4. a. Loops are fundamental programming constructs that allow you to repeat a set of instructions multiple times. In MakeCode Arcade, loops are especially useful for tasks like animating sprites, creating repeated patterns, or controlling different elements.
- b. The break statement changes the normal flow of execution of the statement by exiting the existing loop and continuing the flow of the statement after that loop.



c. Benefits of using functions in programming are:

- Reusability: Avoid writing the same code multiple times.
- Modularity: Break down complex programs into smaller, manageable parts.
- Organisation: Easier to locate and modify specific code sections.

d. To create a function, follow the given steps:

- 1 Open the Functions Block: In the MakeCode Arcade editor, find the "Functions" category at the bottom of the toolbox.
- 2 Create a New Function: Drag the "function" block onto your workspace and rename it (e.g., "movePlayer").
- 3 Add Code to the Function: Inside the function block, define the function's behaviour (e.g., moving sprites, playing sounds).
- 4 Call the Function: To use the function, drag the "call movePlayer" block (or your function name) where you want it to execute.

e. The process of creating a function in MakeCode Arcade:

- In the MakeCode Arcade editor, look for the "Functions" block category. It usually resides at the bottom of the toolbox.
- Drag and drop the "function" block onto your workspace. Rename the function to something descriptive. For example, if the function will handle player movement, you could name it "movePlayer".
- Inside the function block, add the code that defines the function's behaviour. This could involve moving sprites, playing sounds, or any other actions you want to perform.
- To use the function, you need to "call" it. Drag and drop a "call movePlayer" block (or whatever you named your function) where you want the function's code to be executed.

5. a. Swarna can reduce the number of repeated statements in her program by using loops.
b. Maya can use parameter and argument functions.
c. The teacher can use a 'while loop' to continue the quiz until all questions are answered.
d. The developer can use a function to calculate areas, avoiding repetition in the code.
e. The game can stop the search when the key is found by using a 'break statement'.

7. Looping Statements in Python

ASSESS YOURSELF

1. a. (iii) b. (i) c. (i) d. (iii)

2. a. Iterative b. Two c. Infinite d. Break, Continue
3. a. T b. F c. T d. T e. T
4. a. Looping refers to the process of repeating a set of statements repeatedly on the basis of a condition until the condition is falsified.
- b. The values generated by this function are: 10, 12, 14, 16, 18.
- c. Sometimes, there is a situation when the control of the program needs to be transferred out of the loop body, even if all the values of the iterations of the loop have not been completed. For this purpose, jumping statements are used in Python.
- d. The while statement is used to repeat a set of instructions until a condition evaluates to true.

For example,

Program:

```
i = 0
a = input("Enter the string: ")
while i<len(a):
    print("Current Letter: ", a[i])
    i += 1
```

Output:

Enter the string: Orange

Current Letter: O

Current Letter: r

Current Letter: a

Current Letter: n

Current Letter: g

Current Letter: e

- e. The break statement is used for bringing the program control out of the loop. When a continue statement is encountered inside a loop, control of the program jumps to the beginning of the loop for next iteration, skipping the execution of rest of the statements of the loop.
5. a. Swara can use a 'for loop' to repeat a block of statements for a given number of times until the control condition is false.
- b. Manvi can use the 'continue statement' to skip the rest of the current iteration and move to the next one in the loop.
- c. Shami should use the range(2, 13, 2) to print the first 6 even numbers.



- d. Devesh can use a 'for loop' with the range(1, 101) to calculate the sum of all numbers between 1 and 100, as the 'for loop' is ideal for iterating over a known range of values.
- e. Siya can use a 'while loop' to repeat a block of statements until the control condition becomes false.

8. String and List in Python

ASSESS YOURSELF

1. a. (ii) b. (ii) c. (ii) d. (ii) e. (iii)
2. a. del b. append() c. Traversing d. String e. nested
3. a. T b. F c. T d. T e. F
4. a. Traversing b. Square brackets [] c. Backslash (\)
5. a. A list is a type of container that is used to store a list of values of any type. One can store an integer, string as well as objects in a single list.
 b.

```
picnic=[]
print (picnic)
exam= list()
print (exam)
```
- c. An escape sequence is a sequence of characters that does not represent itself when used inside a character or string. It is typically used to specify actions such as carriage returns and tab movements. The backslash (\) is a special character and is also known as the escape character in Python. It is used to represent white space characters, for example, '\t' for tab, '\n' for new line, and '\r' is for carriage return.
- d. A sequence of characters which is enclosed or surrounded by single (' '), double (" "), or Triple ("' "') quotes is known as a string.
- e. upper(): The upper() function converts all lowercase letters to uppercase. Syntax of using upper() function is: string_name.upper().
 capitalize(): The capitalize() function returns a string with the first character in capital. Syntax of using capitalize() function is: string_name.capitalize().
6. a. [10, 20, 30, 40]
 b. r,
 g
 c. python
 d. [1, 2, 3, 4]

- e. Hello
 - f. [5, 7, 8]
- 7.
- a. Yash can use the `append()` function to add elements to the list.
 - b. Mira can use the `capitalize()` method to change the first letter of the string to uppercase.
 - c. Yes, it is possible. Aadya can use the `+` operator to join multiple strings into one string.
 - d. Yes, it is possible. It is called a nested list.
 - e. Pratha can use `remove()` to delete 'Yashik' and `append()` to add 'Mridul' to the list.

9. Introduction to SDGs and Data Science

ASSESS YOURSELF

1.
 - a. (iv)
 - b. (ii)
 - c. (ii)
 - d. (iii)
 - e. (iii)
2.
 - a. Big data
 - b. Organised, Formatted
 - c. Data
 - d. Hadoop
 - e. Components
3.
 - a. T
 - b. F
 - c. T
 - d. F
 - e. T
4.
 - a. Structured Query Language (SQL)
 - b. Python
 - c. Tableau
 - d. Unstructured Data
5.
 - a. AI can help in reaching out the goal by tracking food wastage, finding ways to grow yields, identifying diseases and pest outbreaks, analysing means to reduce population, etc.
 - b. Some of the key challenges to sustainable development are given below:
 - There is instability and conflict between the nations.
 - There is lack of proper planning and implementation of programmes to fit the local level.
 - Non-profit organisations may lack skilled resources such as data scientists and NLP engines.
 - Human bias may be embedded in AI models or datasets.
 - Sensitive data needs to be protected from being made public.
 - c. AI in education can be used to achieve quality education goals by developing smart content, providing personalized guidance, round the clock assistance, virtual learning environment and creating more secured online exams.



- d. A data scientist is someone who uses data sets to create a hypothesis and then works on the data set to analyse the data, interprets it and makes sense of it. A data scientist is responsible for dealing with all types of data. He/she uses various tools and practises to recognise patterns within the data.
6. a. To improve healthcare in remote regions, I would:
- Use AI diagnostic tools (like smart apps or scanners) to assist with disease detection.
 - Implement wearable devices for real-time patient monitoring.
 - Use AI-based learning platforms to train local health workers.
 - Set up AI chatbots and telemedicine platforms to provide remote consultations.
- b. To enhance AI for customer service:
- Collect and clean real customer interaction data.
 - Use data labelling for training NLP and vision models.
 - Apply machine learning to build and improve models.
 - Monitor and reduce data bias for fair results.
 - Use user feedback to retrain and improve AI performance.
- c. Sudhir can relate his presentation to SDG 15: Life on Land, which focuses on protecting ecosystems and biodiversity, highlighting how urbanisation impacts wildlife.
- d. The SDG goal focused on providing affordable and clean energy is SDG 7: Affordable and Clean Energy.
- e. Descriptive analytics helps the stockbroker analyze past stock trends, which is essential for predicting future stock movements based on historical data.

