

1. Basics of Networking and Web Architecture

Unsolved Exercise ?

Section A (Objective Type Questions)

- A.** 1. iii 2. ii 3. iv 4. ii 5. i 6. iii 7. iii 8. i
9. iv 10. ii 11. iii 12. iv 13. iv 14. i a. (ii) b 15. i
16. iii 17. iv 18. i 19. i
- B.** 1. Cyber law (IT Act 2008) 2. firewall 3. Unguided media 4. Bridge 5. Bus
- C.** 1. False 2. True 3. False 4. False 5. True

Section B (Subjective Type Questions)

- A.** 1. Protective Measures while accessing Internet.
- Never click on a questionable link on a website or send an email that you aren't convinced is legitimate.
 - Make sure your passwords are strong and updated on a regular basis.
 - Personal information such as date of birth, home address, personal phone number, account information, passwords, credit and debit card information, and employment history records should never be shared.
 - Report phishing incidents to the appropriate authorities or report them online at cybercrime.gov.in. Mark spam mails if you receive unsolicited emails.
2. Guided media refers to the physical medium through which the signals are transmitted. It is also known as bounded or wired media. Features of guided media are as follows:
- Its speed is very high.
 - It is secure.
 - It is used for reasonably shorter distances.

- The electromagnetic waves are transmitted without the need of any physical medium in an unguided transmission. As a result, it's also called wireless transmission. Features of unguided media are as follows:
- The signal travels over empty space (air).
- Signals can travel through sky propagation, ground propagation, or line-of-sight propagation
- The electromagnetic spectrum used for wireless communication ranges from 3 kHz to 900 THz.

3. Advantages

- The network will not be broken if a single device fails.
- There is no traffic congestion because each computer has its own dedicated point-to-point link.

Disadvantages

- It is more expensive than other network topologies such as star, bus, and point-to-point.
- Installation is quite costly and tough.

4. HTML- Hyper Text Transfer Protocol

- HTTP is a protocol for exchanging hypertext between two or more systems. Links are created using HTML tags. These links can take any form, including text and graphics. HTTP is based on client-server concepts, allowing a client system to connect to a server machine in order to send a request. The server acknowledges the client's request and responds as appropriate.

SMTP-Simple Mail Transfer Protocol

- SMTP is a protocol for sending and distributing emails. SMTP is a secure and simple-to-use protocol. Messages are either delivered to the intended recipient or an error message is displayed explaining why this was not possible.
- One of the functions of an SMTP is to make email message exchange between servers easier. It enables the server to divide a message into categories that the other server can comprehend.

5. Hackers are ethical individuals who use their hacking skills for constructive purposes, such as identifying and rectifying vulnerabilities in a system. Crackers use their hacking skills for malicious purposes, such as stealing or damaging data.

6. Cracker

7. Patent

A patent is a term that refers to a unique product created by a single person. For a certain time, the designer is granted exclusive rights to the patent. The patent right allows the owner to prevent others from creating, using, or selling the product design. If someone uses the patent without authorization, the owner can take legal action. The following conditions must be completed in order to receive a patent:



- The item should be brand new.
- It should be able to be manufactured or used in some industry.
- It should not be a scientific or mathematical breakthrough. It shouldn't be a dramatic, musical, or creative piece.

Trademark

A trademark is a name, a different symbol, or a gadget that identifies a product or service. A specific person or company produces or provides the product or service. A trademark can also be referred to as a brand name. It should be officially registered and legally limited to the usage of a single individual or business.

Copyright

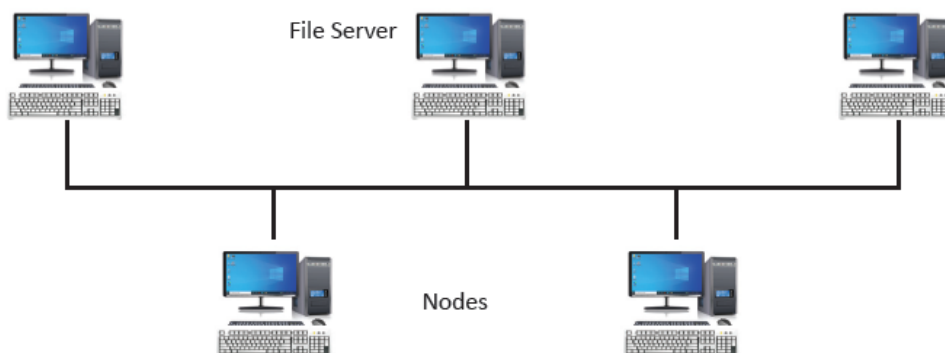
A written document is referred to as copyright. If copyrights are breached, legal action may be taken. Copyrights can be applied to the following types of work. Works of literature and music, as well as any accompanying words.

8. It allows voice to be transferred over a packet-switched network instead of a public switched telephone network. Phone calls can be made utilising a normal internet connection and VoIP software. Because the Telecommunication Company's service is not used, this technique of making phone calls is far less expensive than the traditional method.

- B.** 1. A topology describes how devices (or nodes) are connected. Different types of network topologies are as follows:

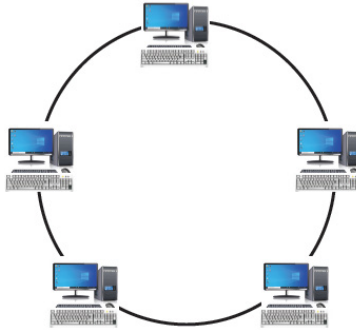
Bus Topology

A bus topology, by definition, nodes need to be connected in a linear order. In a bus topology system, each device is connected to a single wire. It's important to realise that a bus and linear topology do not transport data in both directions. In other words, data can only travel in one direction. A bus topology, like all other topologies, has advantages and disadvantages



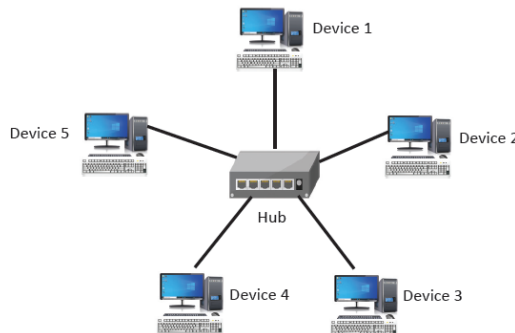
Ring Topology

Ring topology is another simple design. A ring topology, as one might expect, takes the shape of a circle, with each device having two adjacent nodes. Four nodes are normal in a ring topology, although more can be added if necessary. Ring topologies are adaptable and suitable for enterprises of various sizes, and many companies utilise them because of their benefits



2. Star Topology

A star topology for a LAN is one in which each node is connected to a central connection point, such as a hub or switch. A star requires more cable than, say, a bus, but the benefit is that if one cable fails, only one node is affected. Each device in the network is connected to a hub, which is a central device. If one device wishes to send information to another, it must first send the information to the hub, which then sends the information to the specified device.



Advantages

- It is extremely dependable; if one cable or device breaks, the others will continue to function.
- It is efficient since no data collisions can occur.

Disadvantages

- More cable is required than with a linear bus.
- Nodes associated with the connecting network device (network switch) are disabled and unable to communicate with the network.



- Packet switching is a data switching technique in which a data, to be sent, is divide into small pieces. These small pieces are known as packets (fixed-size blocks of data with any content, type, or structure). These packets are then routed individually between nodes through shared data lines. Following figure shows the implementation of the packet switching technique:

Advantages of Packet switching over circuit switching:

- Packets take shortest path as possible to travel across the network as they can access all the paths or lines.
- It allows packets from many sources to share a single line, allowing for more efficient use of the communication medium.

4.	Mac Address	IP Address
	It is a hexadecimal address of six bytes.	This address can be either eight or six bytes long.
	A device's MAC address is provided by the manufacturer of the NIC card.	The IP address of a device is provided by an ISO (Internet Service Provider).
	A MAC address is mostly used to verify a device's/physical computer's address.	The logical address of a computer is defined by the IP address.
	When a machine is moved from one network to another, its MAC address remains the same.	When a machine is moved from one network to another, its IP address gets changed.
	Wing R to Wing P	450 m

- Domain Name Resolution—It is the process of determining the IP address associated with a domain name. This is how it goes:
 - Let's say you want to visit a website and type a URL into your web browser. The browser first looks for the IP address of the server that corresponds to the Domain Name (contained in the URL) on your computer. If this address is present, the associated server is contacted using this address, and the website is then shown in your browser.
 - Otherwise, the browser transmits the domain name to a set of servers (known as domain name servers) that lookup the IP address. After the IP address has been determined, the server is contacted, and the webpage is shown in your browser.

C. Competency-based/Application-based questions:

- (i) LAN (ii) Repeater
- Ring Topology
- Bus Topology
- (i) satellite-type microwave transmission (ii) WAN
- (i) Optical fibre Cable (ii) MAN



2. Website Development Using HTML and Css

Unsolved Exercise

Section A (Objective Type Questions)

- A. 1. ii 2. iii 3. iv 4. iii 5. i 6. iv 7. iii 8. iv
9. iii 10. iii 11. iii 12. iv 13. i 14. ii 15. i 16. i
17. i 18. iii 19. i 20. iv

21. [This question was printed incorrectly in the book. Please correct it in your textbook]

Question: "Text", "Checkbox", "Password" are the values of which attributes of INPUT tag?

- i. Name ii. Type iii. Size iv. Maxlength

Ans: ii

22. iii 23. ii 24. iv 25. i 26. iv 27. iii 28. iv
29. ii 30. iv

- B. 1. HTML link 2. src 3. h1 4. mailto 5. secondary DNS server
6. style 7. selector 8. DNS(domain Name System) 9. HTTP servers
10. Refresh/ reload

- C. 1. False 2. True 3. False 4. False 5. True
6. True 7. True 8. False 9. True 10. False

Section B (Subjective Type Questions)

- A. 1. Static Websites

The most basic type of website is a static website, which is simple to develop. HTML, CSS, and JavaScript are used to create the website. Each page's codes are fixed, therefore the information on the page remains constant and the page appears to be printed.

Dynamic Websites

A dynamic website is one that changes or customises itself on a regular basis and without human intervention. Computer code that generates HTML, generates server-side dynamic pages "on the fly" (CSS are responsible for appearance and thus, are static files).

2. A selector and a declaration block make up a CSS rule. The selector identifies the HTML element that needs to be styled. One or more declarations are separated by semicolons in the declaration block. A colon separates the name of the CSS property and its value in each declaration.



Example

Element Selector

The element selector uses the element name to identify HTML elements.

Here, all <p> elements on the page will be left-aligned, with blue text colour:

```
p {  
text-align: left;  
color: blue;  
}
```

3. Publishing a website involves several steps to make it accessible to users on the internet. Here are the general steps:
 - i. Choose a Domain Name
 - ii. Select a Web Hosting Provider
 - iii. Design and Develop Your Website
 - iv. Upload Your Website Files
 - v. Configure DNS Settings
 - vi. Test Your Website
 - vii. Optimize for Search Engines (SEO).
 - viii. Secure Your Website
 - ix. Launch Your Website
 - x. Promote Your Website
 - xi. Monitor and Maintain
4. (i) <video>- video tag
(ii) <td > - table data tag
5. The definition list is also known as description list. The description list is created by using the <DL> tag in conjunction with <DD> and <dt> tags. The <dl> tag defines the entire description list. The <DT> tag defines the description term. The <DD> tag defines the description term's definition.
6. In an HTML document, External, internal and inline style sheets are different ways in which you can apply CSS
 - External Style Sheet—Define style sheet rules in a separate.css file and then use the HTML link tag to include that file in your HTML content.
 - Internal Style Sheet—Using the <style> tag, define style sheet rules in the HTML document's header section.
 - Inline Style Sheet—Using the style attribute, define style sheet rules inline alongside HTML components.
7. Font variant property Denotes whether a text should be displayed in a small-caps font or not.



8. Comments are used to explain the code and may come in use if you need to edit the source code later. Browsers do not read comments. A CSS comment begins with /* and finishes with */ and is placed inside the <style> element.

9. Hex values

A hexadecimal colour representation is a six-digit number. The first two numbers (RR) denote a red value, the next two (GG) a green value whereas the next two denote a blue value (BB). Any graphics software, such as Adobe Photoshop or Advanced Paint Brush, can generate a hexadecimal value.

10. <html>

<head>

_____ **<style>**

body {

background-____: red;

}

</style>

_____ **<head>**

<body>

<h1>Welcome</h1>

<p>This page has red background color. _____ **</p>**

</body>

</html>

B. 1. CSS is a method sheet language that gives web designers control over how their websites connect with web browsers, including how their HTML documents are formatted and displayed. CSS, or cascading style sheets, is a text-based coding language that specifies webpage formats and how they interact with computer browsers. Web developers can use the language to control numerous style components and functionality, such as layout, colour, and fonts, and hence the formatting and presentation of HTML documents.

2. **Physical Tags:** Physical tags are used in HTML to give the text a physical appearance

Example

 _____ Specifies **bold** text

3. Universal Selector

The asterisk '*' represents the universal selector. All elements are selected when the * selector is used. The * selector can also be used to select all elements that are contained within another element.

Example: Selects all elements, and sets their background colour to maroon:

* {

background-color: maroon;

}



Descendant Selectors

The descendant selector identifies all items that are descendants of a given element. Assume you want to apply a style rule to a specific element only when it is included within another element. The style rule will only apply to the `` element when it is inside the `` tag, as seen in the following example:

```
ul b {  
  color: blue;  
}
```

4. A root server is one whose zone includes the entire tree. A root server, in most cases, does not keep any domain information and instead delegates its power to other servers.

Primary server keeps a file containing information about the zone for which it has the authority. It is in charge of establishing, updating, and maintaining the zone file.

5. The domain name system (also known as "DNS") is in charge of converting domain names into IP addresses so that the client can access the required Internet resources. When users enter the domain name into their browser, DNS servers convert requests for certain domains into IP addresses, allowing them to control which server they have access to.

6. Internal Linking

An HTML internal link connects two pages on the same website. This link might be either absolute or relative. The hash sign (#) follows the name of an HTML internal link. To refer to a section of your page, which is referred to as an internal link to the same page, you must assign an id. When you click on an internal anchor link, your browser will automatically scroll to the specified part and display it.

External Linking

To connect two html webpages, an external link is utilised. External links are formed when you want to go to another page or URL by clicking on a link on a webpage. The anchor tag in html is used to create an external link.

7. **In case you get any publishing error(s), check the following:**

*Make sure your FTP address (host), username, and password are correct.

*To check the given data, use the 'Test connection' command.

*Verify that the remote folder is right! This value can be found in your host's documentation. To browse to a remote folder, use the 'Explore' button. If the pages do not appear, the remote folder is incorrect.

*If the transfer takes a long time, it's likely that you utilised really huge photographs.

*Increase the connection timeout to at least 120 seconds (Menu→Options→publish).

8. Ordered List

An ordered list is also called the numbered list. This type of list is used to display the items in a sequential manner. For example, steps in an algorithm, etc. In HTML, the `` tag is used to create an ordered list.

The `` tag is used to define an item in the list.

Unordered Lists



An unordered list is also called bulleted list. This type of list is generally used to display random items which never require to place in a sequential manner. The tag is used to define an unordered list. The tag has only TYPE attribute which describe the type of bullet style will appear with list items. There are three bullet styles that can be used in an unordered list.

- Disc
- o Circle
- Square

The default bullet style is Disc in HTML.

9.	Flat Name Spaces	Hierarchical Name Space
	A name in a flat name space is just a string of characters with no structure.	Each name in a hierarchical name space is made up of numerous parts.
	An address is assigned to a name in this space.	The first section identifies the organization's nature, the second part specifies the organization's name, the third part defines the organization's department, and so on.
	The names were simple and easy to remember.	The authority to allocate and regulate name spaces in a hierarchical name space can be decentralised.
	As it must be centrally regulated to minimise ambiguity and duplication, a flat name space cannot be employed in a huge system like the internet.	Each designated agent is given authority over the names in each division.

10. Publishing a website involves several steps to make it accessible to users on the internet. Here are the general steps:
- i. **Choose a Domain Name:** Select and register a unique domain name that reflects your website's identity and purpose.
 - ii. **Select a Web Hosting Provider:** Choose a web hosting provider that meets your needs in terms of server resources, reliability, support, and pricing.
 - iii. **Design and Develop Your Website:** Create your website's design and structure using HTML, CSS, and possibly JavaScript. You can use website builders, content management systems (CMS) like WordPress, or code your site from scratch.
 - iv. **Upload Your Website Files:** Transfer your website files to the web server provided by your hosting provider. This typically involves using FTP (File Transfer Protocol) or a web-based file manager provided by the hosting company.
 - v. **Configure DNS Settings:** Update the DNS (Domain Name System) settings to point your domain name to the web server where your website is hosted. This involves setting up DNS records like A records, CNAME records, and MX records.
 - vi. **Test Your Website:** Before making your website live, thoroughly test it to ensure that all pages, links, forms, and interactive elements work correctly across different devices and web browsers.



- vii. **Optimize for Search Engines (SEO):** Implement on-page SEO techniques such as optimizing meta tags, headers, and image alt attributes to improve your website's visibility in search engine results.
- viii. **Secure Your Website:** Install an SSL certificate to encrypt data transmitted between your website and users' browsers. This enhances security and improves trustworthiness, especially if your website collects sensitive information.
- ix. **Launch Your Website:** Once you're satisfied with the testing and optimization, make your website live by updating the DNS settings to point to your web server. Your website is now accessible to users worldwide.
- x. **Promote Your Website:** Share your website's URL on social media, add it to online directories, and implement marketing strategies to attract visitors and increase traffic to your site.
- xi. **Monitor and Maintain:** Regularly monitor your website's performance, security, and user feedback. Update content, fix bugs, and make improvements as needed to keep your website relevant and effective.

C. Competency-based/Application-based questions:

1.
2. The "." In the beginning should be replaced with "#".
3.
4. He can include a table in the HTML webpage.
5. <COLSPAN>

3. Multimedia Design—GIMP

Unsolved Exercise

Section A (Objective Type Questions)

- A.** 1. iii 2. i 3. ii 4. i 5. iv 6. iii 7. i 8. iii
 9. ii 10. iii
- B.** 1. <http://www.gimp.org/downloads/> 2. "View" 3. selection.
 4. Alt 5. Intelligent Scissors 6. Blur/Sharpen 7. Eye icon
 8. Image window 9. Painting/Drawing tool, Copying Content from other images
 10. Drop shadow 11. Patterns 12. Gradients
- C.** 1. True 2. True 3. False 4. False 5. True
 6. False 7. True 8. False 9. False 10. False



Section B (Subjective Type Questions)

- A.**
1. Each distinct transparency is referred to as a layer in GIMP. Gimp's brand-new images only have one layer. To add various aspects to an image, you can add a number of extra layers. A layer offers a range of effects that alter how the image appears. It enables you to work on one aspect of an image while leaving the others alone. Transparent sheets are stacked one on top of the other to form layers. Transparent portions of a layer allow you to see through to the levels below.
 2. You can flip in a horizontal, vertical, or both directions. Flipping and rotating an image are two different things. Rotating an image involves changing its angle, whereas flipping creates a mirror image.
 3. GNU Image Manipulation Program.
 4.
 - i. Scale Tool
 - ii. Flip Tool
 - iii. Pencil Tool
 - iv. Dodge Tool
 - v. smudge Tool
 - vi. Paint Bucket Tool
 - vii. Eraser Tool
 5. Full suite of painting and drawing tools
Several layers and channels for image manipulation
 6.
 - i. Open a suitable image in GIMP as shown.
 - ii. Zoom into your image by clicking at the bottom of the screen as shown. We are taking 50% for this activity.
 - iii. Click on the Clone Tool in the Toolbox. Adjust the brush size.
 - iv. Press Ctrl + Left Mouse Click on the spot of the image you wish to select as the source. The clone tool will copy from this area. In the above image, we have placed the mouse over the foot of the monster as the starting point.
 - v. Next, keeping the left mouse button clicked, drag the mouse over another area to start cloning
 - vi. Repeat the above step till you get a perfect duplicate image.
 7. Layer masks are a vital tool for modifying images. They enable us to manage transparency and other elements. GIMP's layer masks provide a sophisticated approach to modify particular areas of photos that are placed in layers within a GIMP document.

In GIMP, channels are very similar to layers; except, each layer corresponds to a different level in the image's colour model (RGB, HSV or CMYK). Channels dialogues can be chosen in any combination, and are indicated as a gray shading, if currently active.

The function of 'Channels' is to manage selection masks and process colour channels.
 8. Fuzzy Select tool is used to detect the edges of the image automatically on the basis of colour codes and do the selection quickly.



9. This tool is used to show the image as the wet paint on the image has been spread by a finger.
10. In the GIMP software, filters are pre-designed effects with customizable data that aid in image alteration and picture editing tasks. You can use filters on an image, geometric shapes, or text.

11. Fuzzy Select Tool

12. Crop Tool

13. Rectangle Selection Tool	Makes a rectangle-shaped area selection. Making a rectangular selection is as easy as clicking and dragging. When you let go of the mouse, the selection is made.
Ellipse Selection Tool	Selects an area with an elliptical shape (a circular shape). All you have to do is click and drag to make an elliptical selection. When you let go of the mouse, the selection is made.

14. The selection's creation method, including whether it will be mixed with other choices, is determined by the mode. Replace, Add, Subtract, and Intersection are different modes of selection tools

Replace: It will cause existing selection is replaced by new selection.

Add: It will cause new selection to be added to existing selection.

15. Advantage:

Detail-Oriented Selection: The Free Lasso Tool allows users to manually draw around complex, irregular shapes with great precision.

Disadvantage:

Manual Effort and Steadiness: Using the Free Lasso Tool effectively can be time-consuming, especially for intricate selections.

- B.** 1. To use selection tools on images, follow the steps given below:

Step 1: Open the image on which you want to apply selection tool.

Step 2: In the GIMP toolbox, click on the selection tool icon. The selection tool can also be chosen by clicking the desired Selection tools after choosing Tools from the program's menu. To pick the desired area, the tool of choice is dragged over the visible portion of the image.

Step 3: After the region has been chosen, a boundary (such as a rectangle, ellipse, marquee, etc.) is visible all the way around it.

Step 4: The chosen area is used for additional image processing and other processes.

If a user presses and holds down the Ctrl, Shift, and/or Alt keys, the behaviour of selection tools changes. These keys and/or key combinations are referred to as key modifiers since they could be connected to a mode.



2. To use paint tools on images, follow the steps given below:

Step 1: In the toolbox of GIMP, select the paint tool icon. The paint tool can also be selected by clicking the desired Paint tool after choosing Tools from the program's menu.

Step 2: From the GIMP menu, select File and then New to create a canvas. An image can also be painted over. To open an image from the computer drive, select File and then Open.

Drag the paint tool icon on the GIMP canvas while holding down the left mouse button. In order to make tool strokes like pencil, brush, eraser, etc., a tiny circle will appear above your mouse cursor on the GIMP canvas.

Step 3: Click the colour box, which is situated immediately beneath the tool icons in GIMP's toolbox, to select the colour for your paint tool. By default, the colour is black, but you can alter it by selecting one of the square colour samples or by using the gradient sliders.

Step 4: You can configure the pencil, brush, eraser, and other paint tool options. When the paint tool is selected, these choices are displayed on the lower part of the GIMP toolbox. To change the transparency of the painting brush, move the Opacity slider. For various paint tools, one can modify characteristics like size, aspect ratio, and angle.

The Paint Tools listed below are assistive painting tools. With the aid of these tools, the painter can create smooth transitions or add specific effects to the artwork.

3. **Color Balance:** By modifying the levels of cyan, magenta, and yellow as well as the ranges of red, green, and blue, it alters and maintains the colour balance of the current image.

Color Temperature: It can be used to fix the red cast in pictures shot in incandescent light with the camera set to daylight, or even the bluish cast in photos taken in gloomy conditions.

Hue-Chroma: Hue-Chroma can be adjusted, and light saturation can be used to increase the number of colour pixels in an image.

Colorize Tool: The active layer or selection becomes a greyscale image seen through coloured glass when using the Colorize tool.

Threshold: The image is converted to black and white using the threshold effect.

4. Transparent sheets are piled on top of one another to create layers, which allow for the editing of one object without impacting the other objects in the image. We can modify layers, delete layers, move levels around, and create new layers. The background layer is the only layer that exists when we create a new image in GIMP.

Creating a New Layer

You can add a new layer by following the given steps:

Step 1: Click on the Create a new layer button at the bottom of the Layers palette.

Or

Click on Layer menu from the Menu bar and select New Layer from the list. The New Layer dialog box will appear.

Step 2: Fill the values such as name of the layer, its dimensions, etc. and click on OK button. The new layer appears in the Layers palette.

5. For adding a layer mask, We have opened two images in GIMP. First is a coloured photo. And second is the black and white.
 - i. You can see in the layers palette, that the coloured image is the first layer and the black and white image is the second layer.



- ii. Next right-click on the coloured image layer and select Add Layer Mask from the popup menu. A dialog box as follows is shown.
 - iii. For now, leave the setting to 'White (full opacity)' and click on 'Add'. You will see a white box in the coloured image layer. Click on it to select it.
 - iv. Now select the brush tool, and click and drag on the coloured background. The mask layer will ensure that black and white background of the second layer shows through.
 - v. Use Zoom In to enlarge the image and 'brush' the entire background black and white.
 - vi. You should get a colored smiley over the black and white smiley.
6. Same as Ans 5

7. Focus Blur	The area surrounding a focal point becomes blurry due to focus blur. The layer or selection's centre serves as the focus point by default. Drag the centre point to adjust this focus point.
Gaussian Blur	It is a powerful blur tool that works quickly while enabling the user to adjust the size and intensity of the blurring. It takes into account the mean of all pixel values found within a specified region of interest in an image.
Zoom Motion Blur	You can change the blur settings immediately on the canvas using this option, making it simpler to visually adjust the blur settings.
Pixelize	Pixelates an image(appears blurry)

8. Flattening an image in GIMP refers to merging all the visible layers into a single layer.
- i. Open a suitable image in GIMP
 - ii. We will add the thought bubble to a new layer. So click on the Layer → New Layer of press Ctrl + Shift + N on the keyboard. Name this layer as Bubble. Keep the Fill with option as Transparency only and click on OK.
 - iii. Press E on your keyboard to select the Ellipse Select Tool or click on the Rectangle Select Tool and select Ellipse Select Tool from the submenu.
 - iv. Select the second mode as shown below which refers to Add to the current Selection.
 - v. Now using the Ellipse Tool draw 2–3 bubbles as shown.
 - vi. Now click and drag the white foreground colour from the tool palette to any of the bubbles to make the bubbles white in colour.
 - vii. Now, click on Select → To Path.
 - viii. Next click on Edit → Stroke Path.
 - ix. Change Line Width to 18.0 and click on Stroke.
 - x. Next press Ctrl + Shift + A on the keyboard to deselect the selection.
 - xi. Next click on the text tool in the toolbox. Select the font style and size as per your choice. Keep font colour as black.
 - xii. Draw a frame inside the bubble and type LOST! in the bubble. Double click on the text to select it and adjust the size to fill the bubble.
 - xiii. Deselect the text by clicking anywhere in the bubble.



- xiv. Next click on Image → Flatten Image.
 - xv. Now see the final image with a nice thought bubble!
This is how you flatten a thought bubble on an image.
9. To delete a layer in GIMP, you can follow these steps:
 - i. Open your image in GIMP.
 - ii. In the Layers panel, locate the layer you want to delete.
 - iii. Right-click on the layer you want to delete.
 - iv. From the context menu that appears, select **Delete Layer**.
 - v. Alternatively, you can also select the layer you want to delete and press the **Delete** key on your keyboard.

10. Paintbrush Tool

Paintbrush tool is used to draw brush strokes to give an effect of painting to the image. The Paintbrush tool shows various options. For example, Opacity option is used to increase or decrease the transparency of the brush color. Low number indicates transparency and high number indicates opaqueness.

To use Opacity option, follow steps given below:

Step 1: Choose a colour for your Paintbrush by adjusting the gradient sliders.

Step 2: Choose the type of Brush from the Brushes tab.

Step 3: Click on the workspace and drag to draw the flow of brush.

11. **Contiguous:** This option determines whether the selection of the foreground should be limited to contiguous (connected) regions. When enabled, only pixels that are directly connected to each other will be considered as part of the foreground. This is useful when the foreground is a single, unbroken area.

Interactive Refinement: This feature allows for a more dynamic and user-controlled approach to refining the selection. Once the initial selection is made, the user can interactively adjust the selection by painting over areas to refine the edges and include or exclude parts of the image.

Smoothing: This option controls how smooth the edges of the selection will be. Smoothing helps to reduce the jagged edges that can occur when selecting the foreground.

12. Fuzzy Select Tool

Fuzzy Select tool is used to detect the edges of the image automatically on the basis of colour codes and do the selection quickly.

Bucket Fill	It fills an area with a selected color or pattern.
Perspective Clone	Recreates portions of a picture while maintaining perspective; • Blur/Sharpen: Sharpens or softens edges in a painting or photograph.

13. **Smudge Tool:** This tool is used to show the image as the wet paint on the image has been spread by a finger.

Handle Transform Tool: The primary purpose of transform tools is to change how an image or a specific component of an image appears. **Handle Transform** is utilised for adjusting scaling.



Color Picker Tool: By clicking on a certain colour inside an image that has been opened on the screen, the Color Picker Tool is used to choose a colour from the image. This tool allows you to choose the colour of the foreground and backdrop.

Distort Filter-Emboss	It makes the picture appear to be embossed. Option settings include an image's azimuth (a component of lighting), elevation, and depth.
------------------------------	---

C. Competency-based/Application-based questions:

1. Edge Detection Tool
2. Healing Tool
3. Different selection tools will be needed like Rectangle Selection Tool, Ellipse Selection Tool, Free Selection Tool etc and Masking will help in Making Collage.
4.
 - i. Shaurya can start with his and his friends photograph in GIMP, then add a new layer of his friends photograph.
 - ii. He can then see in the layers palette, that the his image is the first layer and the friends' image is the second layer.
 - iii. Next right-click on the his image layer and select Add Layer Mask from the popup menu. A dialog box will open.
 - iv. For now, leave the setting to 'White (full opacity)' and click on 'Add'. You will see a white box in the his image layer. Click on it to select it.
 - v. Now select the brush tool, and click and drag on the coloured background. The mask layer will ensure that friends photograph background of the second layer shows through.
 - vi. Use Zoom In to enlarge the image and 'brush' the entire background with his friends' image.
 - vii. You should get his photograph over the friends photograph.

4. Introduction to Dynamic Websites Using Javascript

Unsolved Exercise

Section A (Objective Type Questions)

- A.** 1. iii 2. iii 3. i 4. ii 5. iv 6. ii 7. iii 8. ii
- B.** 1. 1(one) 2. <script> 3. .js 4. (;)Semi-colon
5. typeof 6. do while loop 7. default 8. question's default answer
9. Brendan Eich 10. Interpreted 11. Operator 12. Expression
13. Dynamic HTML



- C. 1. True 2. False 3. False 4. True 5. True
 6. True 7. False 8. True 9. True 10. True

Section B
(Subjective Type Questions)

- A. 1. **Dynamic Page Creation:** JavaScript allows the users to change the elements of the web pages dynamically.

Validation of User Input: This is one of the primary applications of JavaScript, which allows users to validate input entered into various types of fields such as textboxes.

2. A data type is a classification of the type of data that can be stored in a variable or object. Variables in JavaScript can hold a variety of data types, including numbers, strings, objects, and more.

Data Type	Description	Example
String	textual data	"What is lovely day", 'Pizza'
Number	an integer or a floating-point number	6, 6.43
Boolean	Can have only true or false or 0 or 1 value	true, false
Undefined	the variable is not initialized	let x;
Null	represents no value	let x = null;
Object	key-value pairs of collection of data	let employee = {};

3. The switch statement executes certain statements depending on user's choice. The case statement is used to define different cases where each case has a unique label and a set of statements associated with it

The syntax of the switch statement is given the following:

```
switch(choice)
{
case 1:
Statements of block 1;
break;
case 2:
Statements of block 2;
break;
.
.
.
default:
Statements of block last;
}
```



4. An infinite loop is a piece of code that never ends because it never reaches the ending condition.
5. Confirm method is used to obtain confirmation from the user about an action. For example, if a user wants to delete something or cancel a purchase on an online website, a dialog box will display asking the user to acknowledge the deletion or order cancellation. Confirm method brings up a dialog box with a question mark icon, a question, and two buttons: OK and Cancel.

Example:

```
<HTML>
<HEAD>
<TITLE> Using confirm box </TITLE> </HEAD>
<BODY>
<script type="text/javascript">
var answer=confirm("Do you want to cancel your Aadhaar Application?");
if (answer == true) {
alert("Application has been canceled!");
}
else{
alert("Book appointment for biometric scan");
}
</script>
</body> </html>
```

6. Sometimes, you need to repeat a task multiple times or you may need to repeat the task either a certain number of times or until a condition is satisfied. In JavaScript, the statements that are used to repeat a set of instructions are called iterative or looping statements or simply loops. Loops are very useful and necessary for developing applications.
7. The for statement or loop is used to repeat an instruction or a set of instructions for a fixed number of times. The syntax to use the for loop is as follows:
for (initialisation_expression; conditional_expression; update_expression) {
// loop body
}
8. "33"
9. -1
1
-5
4
5foo
10. 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, jump statements are used in JavaScript. JavaScript offers two jump statements—break and continue.



11. JavaScript was developed by Brendan Eich, a programmer working at Netscape Communications Corporation. He created the language in 1995 while working on Netscape Navigator, one of the earliest web browsers.
12. Visual studio editor
13. JavaScript has various uses/applications as shown below:

Development of Multimedia Applications: JavaScript can be used by the user to include multimedia elements like images, audio, video, animations, etc. within the web pages. You can show, hide, modify, resize, and create picture rollovers with JavaScript. By adding scrolling text to the status bar, multimedia applications can become more engaging.

Dynamic Page Creation: JavaScript allows the users to change the elements of the web pages dynamically.

14. In JavaScript there are two types of comments,
 - i. Single line comments are added by using // .
 - ii. Multi-line comments are added by using /* and */.

- B.** 1. JavaScript code can be written in a file and saved with the .js extension and this file can then be linked inside the **<HEAD>** and **</HEAD>** tags of the HTML document in which we want to add this code. The SRC attribute of the **<script>** tag allows to give path of the JavaScript file. The syntax to add external JavaScript is:

```
<HEAD>
<SCRIPT TYPE="text/javascript" SRC="D:\first.js">
</SCRIPT>
</HEAD>
```

To use external JavaScript, follow the given steps:

Step 1: Open the Notepad and type the following line:

```
alert("Hello World");
```

Step 2: Save the file with .js extension.

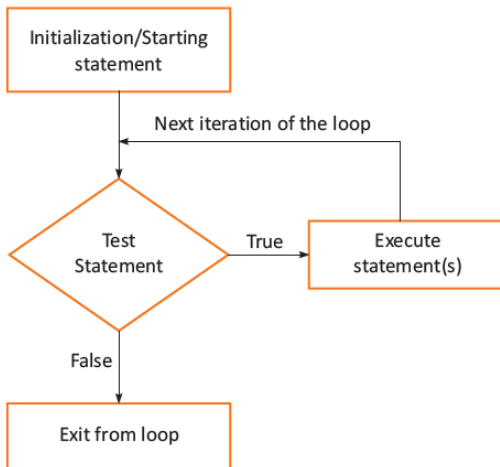
Step 3: Open another Notepad and type the following code:

```
<HTML>
<HEAD>
<TITLE> My First JavaScript </TITLE>
<SCRIPT TYPE="Text/javascript" SRC="external.js">
</SCRIPT>
</HEAD>
<BODY>
This message box is displayed using external JavaScript.
</BODY>
</HTML>
```

Step 4: Save the file with .html extension and open the web page in a web browser. You will get the same output as the previous web page.

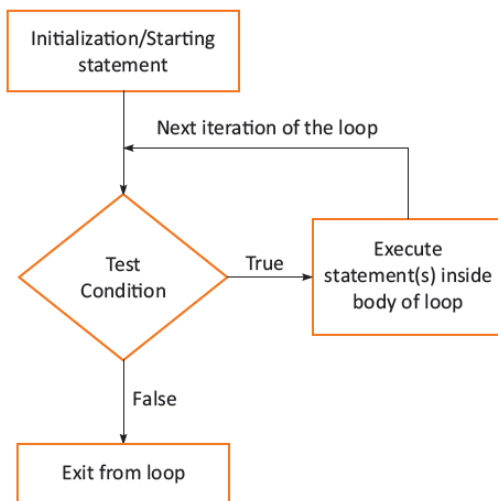


2. The for statement or loop is used to repeat an instruction or a set of instructions for a fixed number of times. The syntax to use the for loop is as follows:
- ```
for (initialisation_expression; conditional_expression; update_expression) {
// loop body
}
```



The **while** statement or loop is used to repeat a set of instructions until a conditional expression returns True. Once the expression returns False, the loop is terminated. Following is the syntax of the while loop in JavaScript:

```
initialisation_expression;
while (conditional_expression) {
//loop body
update_expression;
}
```



3. The **while** statement or loop is used to repeat a set of instructions until a conditional expression returns True. Once the expression returns False, the loop is terminated. Following is the syntax of the while loop in JavaScript:

```
initialisation_expression;
while (conditional_expression) {
//loop body
update_expression;
}
```

Do while is a different type of loop than either the for or while loops. This loop will always execute the statement at least once, even if the condition is false. After one iteration of the loop has been completed, the condition is checked. Depending on the condition, the loop will continue to run further or terminate.

Syntax of the do...while loops is as follows:

```
initialisation_expression;
do
{
//Loop body
update_expression;
} while (conditional_expression);
```

So we use "do while" only when first iteration is utmost necessary.

4. A web page is traditionally made up of three separate parts with separate responsibilities: HTML code defines the structure and meaning of the content on a page, CSS code defines its appearance, and JavaScript code defines its behaviour.

Both JavaScript and HTML are the required web technology languages used to create a fully functional web application or web page. To put it simply, JavaScript improves the user interface of the web page and makes a web page interactive, hence enhancing the user experience.

HTML is capable of producing pages that are more or less static. The view doesn't alter much once you load them up until you click a link to go to a new page. Adding JavaScript to your code, on the other hand, allows you to alter the appearance of the page in a variety of ways, like changing the text, changing the colours, changing the options accessible in a drop-down list, and much more.

5. Implicit Type Conversion

When an expression is evaluated and two different types are given that are incompatible to perform the operation, JavaScript automatically converts them. For example:

If one value is a number and the other is a string, the expression turns the string to a number and performs the arithmetic operation. For example,  $12 * "5"$  returns the number 60, and  $2 - "5"$  returns -3.

### Explicit Type Conversion

The developer does this type of conversion by utilizing the built-in type conversion methods.

|                                   |              |
|-----------------------------------|--------------|
| <b>For Example:</b> Number(false) | Output:0     |
| Number("77")                      | Output:77    |
| Number("69 58")                   | Output:NaN   |
| String(Boolean(1))                | Output: true |

6. Composite data types are those data types of Javascript whose variables can hold different types of values in it. Example Object ,  $k=\{\}$ , it can hold key-value pair.
7. NULL means 'no value' but it is intentionally given to a variable as a value. When a variable does not receives a value, it means it is not initialised and it is not even holding any NULL value too, it is said to be undefined.
8. When declaring a JavaScript variable, there are some guidelines to follow:
  - The variable name must begin with a letter (a to z or A to Z) or underscore(\_). No spaces are allowed. Examples are sal, \_pf, total\_salary.
  - We can put digits (0 to 9) after the initial letter, for example data1, data2, etc.
  - Variables in JavaScript are case sensitive, so a and A are two separate variables.
  - Variable names can contain letters, digits, or the symbols \$ and \_.
  - Variable names cannot contain blank space.
  - Variable name cannot be a reserved keyword.
  - Variable names cannot contain blank space.
9.
  - a. The SRC attribute of the <script> tag allows to give path of the JavaScript file
  - b. the **TYPE** attribute is used with the <SCRIPT> tag and set its value to **Text/JavaScript** to specify that scripting language we are using
  - c. When used by the <script> element, the **charset** attribute specifies the character encoding used in an external script file.
10.
  - a. 

```
var a =5;
var b=7;
var sum1= a+b;
document.write(" Sum is "+sum1);
```
  - b. 

```
var x=25;
ans=Math.sqrt(x);
document.write(" Square root is "+ans);
```



- c. `var x=15.5;`  
`ans=typeof(x)`  
`document.write(" Datatype is "+ans);`
- 11. `var str1= "This is a world of miracles";`
  - a. `document.write(" Length of str1 "+str1.length);`
  - b. `document.write(" first occurrence of world in str1 is "+str1.search("world"))`
  - c. `document.write("@@^^"+str1+"^^@@")`
  - d. `document.write(str1.substring(4,12))`
- 12. a. 13  
b. 16  
c. @  
@  
@  
@  
@  
d. The number is 1  
The number is 2  
The number is 4  
The number is 5

**C. Competency-based/Application-based questions:**

1. He can include JavaScript for introducing interactive elements.
2. She can take a value online using prompt function.
3. `<script type = "text/javascript">`  
`var prod, counter ;`  
`prod = 2;`  
`for(ctr=2; ctr<=9; ctr+=2)`  
`{`  
`prod = prod*ctr;`  
`ctr = ctr+2;`  
`document.write(prod+" "+ctr+" <BR>");`  
`}`  
`</script>`
4. i. Relational  $\rightarrow (>=)$  greater than or equal to  
Logical  $\rightarrow (!)$  NOT  
ii. if ( $B < A$ )

