AIP

2 marks questions

**1] List different types of metadata.**

Metadata refers to descriptive information about data or resources that provides context and additional details.

Title metadata: It is responsible for the Web page titles and is shown at the top of your browser window.

Description metadata: It can be regarded as the textual description that is used by a browser while returning Web page in response to your search.

Keyword metadata: It can be defined as the search phrase that visitors enter in the search engine in order to find relevant Web pages.

**2] Distinguish ON PAGE and OFF PAGE SEO (Any 4)**

| S. No. | On-Page SEO | Off-Page SEO |
|---|---|---|
| 1. | On-page SEO includes providing good content, good keyword selection, putting keywords in correct places, giving an appropriate title for every page, etc. | Off-page SEO includes link building, increasing link popularity, search engine, link exchange etc. |
| 2. | On-page SEO will analyze the complete website. | In off-page SEO we will promote the website. |
| 3. | On-page SEO we will use internal linking. | In off-page SEO we will use direct linking. |
| 4. | On-page SEO is for Content writing. | Off-page SEO is for Article writing. |

| S. No. | On-Page SEO | Off-Page SEO |
|---|---|---|
| 5. | Techniques that are used in on-page SEO.<br>Publish high-quality content.<br>Optimize page titles and meta descriptions.<br>Optimize page content.<br>Headings and content formatting.<br>SEO Images and other multimedia elements.<br>URL optimization.<br>Internal links.<br>External links. | Techniques that are used in off-page SEO.<br>Influencer Outreach.<br>Contribute as Guest Author.<br>Social Media Engagement.<br>Social Bookmarking Sites.<br>Forum Submission.<br>Blog Directory Submission.<br>Article Submission |
| 6. | According to the MOZ website owners spend about 70% of time on on-page activity | While on off page it only 30% activity |
| 7. | On-page SEO looks at what your site is about. | Off-page SEO looks at how popular your site is. |
| 8. | Factors that impact On-page SEO are as follows-<br>Internal Linking<br>Mobile Friendly<br>Navigation<br>Content Quality<br>Meta Descriptions | Factors that impact Off-page SEO are as follows-<br>Social Media<br>Backlinks<br>Mentions<br>Google Business Profile (earlier Google My Business) |

| S. No. | On-Page SEO<br><br>Image Alt Text<br>Page Speed<br>Core Web Vitals<br>Title Tags | Off-Page SEO |
|---|---|---|
| 9. | Both SEO work together in a complementary fashion to achieve Search Engine Optimization which is our main goal. We cannot select which is more important between the two. But in the whole process, SEOs recommend that the focus should be given to on-page SEO before off-page SEO. | Both SEO work together in a complementary fashion to achieve Search Engine Optimization which is our main goal. We cannot select which is more important between the two. But in the whole process, SEOs recommend that the focus should be given to on-page SEO before off-page SEO. |
| 10. | Applying relevant subtopics to content is the example of on-page SEO. | Link Building is the example of off- page SEO. |

**3] List any two tags / elements that have been introduced in HTML5.**

<video>: The <video> tag is used to embed video content directly into a web page without the need for plugins or external media players. It supports various video formats (e.g., MP4, WebM) and provides a simple and standardized way to include videos on websites.

**<video src="example-video.mp4" controls></video>**

<canvas>: The <canvas> element provides a space on a web page where you can dynamically draw graphics, animations, and visualizations using JavaScript. It essentially acts as a drawing surface that allows you to manipulate pixels and create interactive graphics.

**<canvas id="myCanvas" width="400" height="200"></canvas>**

The <article> tag is one of the semantic HTML5 elements introduced to provide structure and meaning to web content

It helps search engines and other technologies understand the main content of a page and distinguish it from other sections.

**<article>**

**<!-- Content of the article goes here -->**

**</article>**

**4] Describe any four conditional statements used in JavaScript.**

if statement: The if statement allows you to execute a block of code if a specified condition is true.

```
if (condition) {
  // Code to be executed if the condition is true
}
```

if...else statement: The if...else statement enables you to execute different blocks of code based on whether a condition is true or false.

```
if (condition) {
  // Code to be executed if the condition is true
} else {
  // Code to be executed if the condition is false
}
```

else if statement: The else if statement allows you to test multiple conditions, providing an alternative branch if the initial condition is false.

```
if (condition1) {
  // Code to be executed if condition1 is true
} else if (condition2) {
  // Code to be executed if condition2 is true
```

```
} else {
  // Code to be executed if none of the conditions are true
}
```

switch statement: The switch statement evaluates an expression and executes blocks of code based on different cases.

```
switch (expression) {
  case value1:
    // Code to be executed if expression matches value1
    break;
  case value2:
    // Code to be executed if expression matches value2
    break;
  default:
    // Code to be executed if expression doesn't match any case
}
```

Ternary operator: The ternary operator is a shorthand way to write conditional statements and assign values based on a condition.

```
condition ? value1 : value2
```

**5] Explain the State of Analytics union**

The State of Analytics Union refers to the current state or condition of analytics practices and technologies. It encompasses the latest trends, advancements, and challenges in the field of analytics, including data collection, analysis, and insights generation. It highlights the integration of analytics into various industries and the overall impact of analytics on decision-making processes.

**6. List some of the challenges in implementing Web 3.0.**

- Interoperability: Ensuring seamless communication and compatibility among various decentralized technologies and platforms.
- Scalability: Handling the increasing volume of data and user interactions within a decentralized web environment.
- Privacy and Security: Addressing concerns regarding data privacy, security, and trust in a distributed network.
- Governance and Regulation: Establishing frameworks and standards to govern decentralized systems and resolve disputes.
- User Adoption: Encouraging users to adopt and understand the benefits of Web 3.0 technologies and decentralized applications (dApps).

OR


**7. Define Organic search**

Organic search refers to the process of obtaining website traffic naturally or "organically" through search engine results, without relying on paid advertisements.

It involves optimizing a website's content, structure, and other factors to improve its visibility and ranking in search engine results pages (SERPs).

**8. Indexing in MongoDB**:

In MongoDB, indexing is the process of creating an index on a specific field or set of fields within a collection. An index improves query performance by allowing the database to quickly locate and retrieve relevant documents based

on the indexed field(s). The index stores the indexed field's values in a data structure that facilitates efficient searching, sorting, and filtering operations.

In MongoDB database, every field in the documents is indexed with primary and secondary indices

## 9. List the usage of JavaScript

- Certain validations to be performed on the client side, such as not leaving any text field blank, match of the password, and the confirmation of password fields, can be checked at client side by using JavaScript as the scripting language.

Class comments

- JavaScript is also helpful in creating cookies. It can be used to either store or retrieve relevant information on the client's computer.
- JavaScript also enables you to load a specific page depending upon the client's request.
- JavaScript is used to write functions that are embedded in or included from HTML pages and interact with the Document Object Model (DOM) of the page.
- JavaScript is also helpful in changing the image as the mouse cursor moves over them.
- JavaScript is also helpful in calling the new Web page according to the client or user's action

OR

- Enhancing interactivity and user experience on websites.
- Validating and manipulating form data before submission.
- Creating dynamic and responsive web page elements.
- Implementing client-side data storage (e.g., cookies, local storage).
- Building interactive web applications and games.
- Performing asynchronous operations, such as making API calls and handling responses.
- Creating interactive maps and data visualizations.
- Implementing user authentication and authorization on the client-side.
- Developing cross-platform mobile applications using frameworks like React Native.

## 10. Explain Search Engine basics

- Search engines enable users to search for information by entering keywords or queries. They collect and index web pages from the internet.
- When a user performs a search, the search engine retrieves and presents relevant web pages. Algorithms are used to determine the ranking and order of search results.
- Factors such as relevance, authority, and user experience are considered in the ranking process.
- Examples Google, Bing, and Yahoo.

**Main components**
Crawling
Indexing
Ranking

## 11. Levels of DOM

The Document Object Model represents the entire HTML document as a hierarchical structure of objects.

Q4. List the levels of DOM.

Ans. The levels of DOM are as follows:

Level 0: The application supports an intermediate DOM, which existed before the creation of DOM Level 1. Examples include the DHTML object model or the Netscape intermediate DOM. Level 0 is not a formal specification published by the W3C, but rather a shorthand that refers to what existed before the standardization process.

Level 1: It includes the navigation of DOM (HTML and XML) document (tree structure) and content manipulation (includes adding elements). HTML-specific elements are included as well.

Level 2: XML namespace supports filtered views and events.

Level 3: This level consists of the following six different specifications:

1. DOM Level 3 Core
2. DOM Level 3 Load and Save
3. DOM Level 3 XPath
4. DOM Level 3 Views and Formatting
5. DOM Level 3 Requirements
6. DOM Level 3 Validation, which further enhances the DOM

## 12. List any two different types of XML sitemaps.

XML sitemaps are protocols with the help of which you can provide list of all Web pages that you would like them to crawl and index.

**Mobile sitemaps**: Mobile sitemaps are used for content targeted for mobile devices. Mobile information is stored in a single Sitemap file that does not include any information about non-mobile URLs.

**Video sitemaps**: Video sitemaps include information about your videos in your Sitemap file, thus increasing the chances of discovering the video by the search engines. Google supports the various video formats such as .mpg, .mpeg, .mp4, .m4v, .mov, .wmv, .asf, .avi, .ra, .ram, .rm, .flv, and .swf.

**Image sitemaps**: You can also enhance the visibility for your images by specifying them in your sitemap file. For each URL that you include in your Sitemap file, you can also enlist the images that are displayed on that Web page. You can enlist 1,000 images per page. Particular image tags are related with the URL.

Listing of images in the Sitemap file increases the probabilities of those images being indexed. If you provide some images on a Web page and left others, then this indicates that the left out images are less important.

## Role of the DOCTYPE element in HTML5

The DOCTYPE (Document Type Declaration) element in HTML5 specifies the version and type of HTML used in a web page.

It informs the browser about the document's type and triggers the appropriate rendering mode. By including the DOCTYPE element, web developers ensure that the HTML document is interpreted correctly by different browsers, helping to ensure consistent rendering and behavior across platforms.

## Search Engine

A search engine is an online platform or software that enables users to search for information on the internet. It indexes web pages from across the web and provides a searchable database of indexed content. Users can enter keywords or queries, and the search engine retrieves and displays a list of relevant web pages Popular search engines include Google, Bing, Yahoo, and others.

## Optimal strategy for selecting a web analytics tool:

- Define goals and requirements for web analytics.
- Evaluate features and functionality of different tools.
- Consider scalability and flexibility to meet future needs.

- Analyze the cost and budget implications of the tool.
- Seek recommendations and reviews from industry peers and experts.
- Conduct trials or demos of shortlisted tools.
- Assess training resources and support provided by the tool vendor.

**Web Analytics 2.0**

Web Analytics 2.0 refers to an evolved approach to web analytics that focuses on analyzing user interactions and engagement beyond basic website traffic metrics.

It emphasizes understanding user behavior, tracking social media interactions, and measuring the impact of various marketing channels.

**Examples (Any 3)**

- Social networking platforms like Facebook, Twitter, and LinkedIn
- Video-sharing platforms like YouTube and Vimeo
- Blogging platforms like WordPress and Blogger
- Collaborative platforms like Google Docs and Dropbox
- Social bookmarking sites like Pinterest and Reddit
- Podcasting platforms like Spotify and Apple Podcasts
- User-generated content platforms like Instagram and TikTok

**10 marks questions**

**1] Explain the working of crawler based search engines with suitable examples.**

Crawler-based search engines, also known as web crawlers or spiders, are a fundamental component of search engine technology. Here is an explanation of how crawler-based search engines work, along with suitable examples:

Web Crawling:

- Web crawlers start by selecting a set of seed URLs, which are typically popular websites or pages.
- The crawler sends HTTP requests to the seed URLs, retrieves the HTML content, and analyzes it.
- The crawler extracts links from the HTML content, following them to discover new web pages.
- This process is repeated recursively, crawling through links on each page to reach new pages.

Indexing:

- As the crawler visits web pages, it collects data such as the page's title, meta tags, and textual content.
- The collected data is processed and indexed in a searchable database, which forms the search engine's index.
- The index organizes the information, making it easier and faster to retrieve relevant pages when a user performs a search.

Ranking and Retrieval:

- When a user enters a search query, the search engine retrieves the most relevant web pages from its index.

- The search engine's ranking algorithm analyzes various factors, such as keyword relevance, page authority, and user signals, to determine the order of search results.
- The most relevant pages are presented to the user based on their ranking.

**Example: Google Search Engine:**

Google's crawler, known as Googlebot, starts with a set of seed URLs and follows links to discover new pages.

It analyzes the HTML content, extracts information, and indexes it in Google's massive search index.

When a user performs a search, Google retrieves relevant pages from its index and ranks them using its complex ranking algorithm.

The search results are presented to the user, with the most relevant and authoritative pages appearing at the top.