Question 1:

Intent : Learn the basics of how web applications are built and what technologies could be used for web applications.

Suppose you were given to build a web application for https://www.boats.com/ from scratch as a startup . Imagine you would be solely responsible to build it's frontend, backend, design database, setup media storage, deployment, ci/cd automation and everything else. Thus, do some research on your part and write down your response to the following questions.

a.   Which backend framework would you prefer to use and why?
b.   Which frontend framework would you prefer to use and why?
c.   Which database would you prefer to use and why?
d.   What would you use for version control of the codebase ?
e.   Which platform would you prefer for media storages (eg. storage of product images) ?
f.   Where would you deploy your application and which web server would you use and why?

For **startup**
 I would consider following things.
1. Choose technologies that are **open source**
2. **Availability of resources** and **community support**.
3. **Easy to use** and yet **scalable.**

a) Which backend framework would you prefer to use and why?

- Since this application is I/O intensive and not computational I would choose **Express.js** (Nodejs run environment)
- Its also a non-blocking I/O and event loop architecture It can **serve many requests**.
- It has rich **community and support** and so many **useful NPM packages** that prevents reinventing the wheel for features and thus saves time.

b) Which frontend framework would you prefer to use and why?

- I would go with **Next.js** which is built on React library.
- The SEO(Search Engine Optimization) and Server side rendering can be done efficiently.
- Since this application is user facing, SEO plays a huge role in deciding the success of the product.

c) Which database would you prefer to use and why?

- I would choose **MongoDB** it used NO SQL database where it stored data in forms of documents.
- Due to it's **dynamic schema, flexibility and ability to store huge data**.
- In startups since we have to go through so many iterations of model schema MongoDB is very helpful.

d) What would you use for version control of the codebase ?

- I would use Git for version control of my codebase.
- As it is **open source, easy to use, popular and great community support**
- Moreover, it serves the purpose.

e) Which platform would you prefer for media storages(eg. storage of product images) ?

- I would prefer using **S3 bucket** (AWS Component)
- Due to its **low pricing, easy to integrate APIs and provides simple Node.js SDK.**

f) Where would you deploy your application and which web server would you use and why?
- I would use **EC2 instance** (AWS Component) to deploy my application
- As this botas.com is going to be a seasonal website i.e., Customers turn up only when there is necessity of boats
- I will assume that I will have maximum requests to the server during the peak season and will consider **m7g.large** which has **2 CPU, 8GiB of Memory, Network bandwidth up to 1.25** to deploy my application.

To conclude with Search Engine Optimization, User's event tracking, Developer Experience, User's Experience, page loading speed and Latency of API play an important role in making this website and I believe all the above chosen components will address these key points and make boats.com and efficient website