// Place your answers for questions 1 and 2 here. Be sure to label each answer clearly.

Q1 –

a. JavaScript Runtime – JavaScript Runtime is where JavaScript code is executed, js runtime and js engine are two parts of running the js code. Parsing the code and making it such that it can be used as a command is the work of JavaScript Engine, and providing objects and environment to the JavaScript such that it can interact with the outside world for functioning is the JavaScript Runtime. Chrome and Nodejs use the same JavaScript engine which is V8 engine made my Google Chrome, but the runtimes are different, that is the reason we have window and DOM for Chrome but for Nodejs we have require.

JavaScript Runtime can be understood as a provider for the Nodejs, which facilitates executions of commands which are not available inside the V8 engine.

Nodejs interface with Chrome V8 engine process – V8 engine provides the facility to execute js codes and commands inside the js runtime. Written in C++ this is an engine which converts JS code to a more efficient machine-readable code which makes the execution faster, it uses the api embedded inside the V8 engine to execute programs.

b. Even Driven and Non-blocking – The term even driven is denoted for Nodejs architecture, in which the event loop is waiting for an event to happen, in Nodejs architecture event driven and non-blocking are interlinked to each other due to the way the Nodejs runtime works.

Even loop allows Nodejs runtime to perform non-blocking continuous input output operations, it is very amazing in itself that how a single threaded handler can continue with various operations without blocking its way. Whenever there is an operation that can take time or related to database, the operation is transferred to the system kernel, which nowadays is multi-threaded, and when the work is complete the event loop hands back the same result back to where it was required. Instant operations are completed and resource-oriented operations are transferred to the OS for completing, thus in this manner the code runs without any hiccups.

c. NPM Package – NPM stands for Node Package Manager which contains all the libraries for Nodejs, it is the largest repository of libraries available for nodejs. We can install packages through 'npm' command. NPM can also be used to control and execute multiple versions of node and its libraries.

(i) Installing Packages Globally – npm install <Package Name> -g

(ii) Installing Package locally for current Application – npm install <package name> --s

(iii) Installing package for dependency – npm install

(iv) Import package:–

import defaultExport from “module-name”;

import * as name from “module-name”;

//https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Statements/import

//https://www.geeksforgeeks.org/model-view-controllermvc-architecture-for-node-applications/

//https://www.brainvire.com/six-benefits-of-using-mvc-model-for-effective-web-application-development/

Q2 –

a. MVC components – MVC stands for Model, View, Controller. These components are interconnected architectural infrastructure. In this structure these three components of an application are divided into different folders and logically connected to each other.

   Model – Model is for providing the structure of the database part of the application, it contains the format that the user wants for the data.

   View – View is for how the user wants the representation of the web application at the visual level, this section contains the static and dynamic pages for the application.

   Controller – Controller as the name represents, has the ability to get request and respond to the requests. When the user interacts with the view, the controller is the only in backend working to provide the respond as per the commands. Controllers renders the appropriate view and responds to the requests.

   For implementation we need to create database models inside the models folder, the views folder will have the templates and layouts for the web application which will be used by the controllers inside the controller folder with the help of routes, req, and many other functions. With this we can understand that Controller is actually the brain of this whole ecosystem that combines all the parts logically.

b. Advantages and how and why – There are many advantages of using MVC architecture:
   1. Faster Development: Since the application is divided in parts and well manages, the team can work on different parts at the same time, this can reduce the work time required to build an application.
   2. Multiple Views: Since the views can be used with the help of controller anywhere as desired and various views can be created, there is less need for multiple same codes and this this can be very efficient in terms of coding and facilitating the views.
   3. Easy Modification: Adding new views and data is very easy with the MVC architecture, thus with time there can be multiple changes without much hassle.
   4. Data success and response easy: Various data forms can be used within model and restrictions setup is easy.
   5. SEO friendly: Development helps is creating search engine friendly urls and application, which can be more SEO friendly.
   6. Async support: Due to this architecture Asyn features helps developers in using them in web application development.