**Section 1- Theory [40 Marks]**

1. **Analyse server-side frameworks- Django, Asp.net, and Laravel that are used to create a dynamic web application. In your analysis include a brief description, features (4) and limitations (3) of the framework. [6 marks for each framework, 6 X 3 =18 marks]**
2. **Django**

* **Features**

Django is a back-end server side framework written in Python. It is free, open sourced and it encourages rapid development and clean, pragmatic design. The features of Django could be summarized as :

* Fast. Perfectly for deployments with deadlines .
* Fully loaded. It includes dozens of extra utilities.
* Secured. It helps developers to avoid risks of data exposure.
* Scalable. Django has ability to quickly and flexibly scale.
* Versatile. Developers can build all sorts of things with it.
* **Limitations**

Django has its certain set of files and structure, developers have to follow everything that are defined in the frame work, hence, it lacks flexibility. Additionally, it is not a good option for small projects due to the massive fundamental codes it has.

1. **Asp.net**

* **Features**

Asp.net as the short of Active Server Pages Network Enable Technologies, is an open source, server side web-application framework for building dynamic web pages and services with .NET and C#. It was developed by Microsoft. It is fast and scalable. Developers can build secure apps with ASP.NET and get supported from its active community and open source. It provides flexible developing environment.

* **Limitations**

Comparing to other server side framework, it costs higher. Some features or tools can only been used by purchase. Documentation on ASP.NET is not up to the level of expectation. Application transferring and customization can a challenge base on its own database management and version sensitive.

1. **Laravel**

* **Features**

Laravel is a free and open source PHP web application with expressive and elegant syntax. Laravel offers build-in authentication system. Effective ORM allows fast communication with database. It adopts the MVC architecture. Build-in libraries and modular, secure migration system, and so on.

* **Limitations**

It does not support the payment feature which is big pain for web developers. Lack of continuation between versions, the app would be broken down during the transfer between different version and code updating. Some upgrades might be problematic.

1. **Compare server-side programming languages- C#, PHP and Python.**
2. **C#**

C# is object oriented programming language. It is simple to use and it provides structured approach. It is widely used in modern application development. C# type safe code can only access the memory location that it has permission to execute. Therefore it improves a security of the program. Since is an OOP and component oriented language, it is easy to do scalability and upgrading. Microsoft provides an active and open source community for developers to get support from each other. C# can be used in variety of development, such as web app, mobile app and games. The charged features in IDE of C# would increase the cost of the language usage.

1. **PHP**

PHP is a popular scripting language, it is simple and open-source. PHP is easy to install and learn, it runs on various platforms. It supports many protocols and can be well-connected with databases. PHP is an interpreted language, hence it does not need compilation, which makes it runs faster. It manages to offer both high level of security and flexibility with some pre-defined functions and third-party applications. It also has active community support from global uses. PHP is quite scalable and works well with various frameworks like Symfony, Codeigniter, Zend, CakePHP and many more. PHP web development does not cost heavily on and hence is just the right choice for startups or small organizations to go for.

1. **Python**

Python is a high-level, interpreted, interactive and object-oriented scripting language. It is designed to be highly readable. It can run on wide variety of hardware platforms and provides interfaces to most of major commercial databases. Python is doing well on scalability as it provides a better structure and support for large programs than shell scripting. It is widely used, especially for IA and data science fields. Same as other popular programming languages, Python has its active community due to its nature of open source and the booming of AI and automation. Python can delivery high level of security with the effort of professionals. Python has a huge number of reusable software libraries, it is easy for people to learn and read, hence It is a cost-effective programming language.

1. **List the four factors, a back-end web application developer should consider in selecting a suitable tech stack for the ATC Movie Blog. [4 marks]**
2. **Security**

The most crucial factor of considering a appropriate tech stack is security. The developer should evaluate the security performance of the stack in both server side and client side to avoid the future risk.

1. **Scalability**

A rapid growth should be taken into consideration when the project starts. It is significant to get well known the potential scalability of a tech stack and make sufficient preparation for the business expanding.

1. **Time efficiency**

Another factor should be considered when it comes to selection tech stack is the time efficiency. If the developer was asked to launch the project as soon as possible, it is the best option to choose a framework which has abilities of fast deployment and testing.

1. **Cost**

It is a factor that real world developer has to consider at the beginning of the project. It should be evaluate along with the performance in order to meet business requirement.

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