Question No: 01

a) **Explain the functional units of an organization in detail.**

Ans) Functional units of an organization:
Five groups of functions are there in every organization:

Production:

Production creates products which humans want and are willing to pay for, which boosts the economy and allows manufacturers to continue producing more and more outputs.

For example, a clothing company may distribute clothing as their product, but the clothing itself is manufactured by an entirely different organization overseas. Sometimes the intangible process of brainstorming ideas for the products' formation is also considered to be a part of the production process. An example of this is Apple. They design all of their electronics in California, but have them produced overseas.

Quality Management:

The aim of quality management is to ensure that all the organization's stakeholders work together to improve the company's processes, products, services, and culture to achieve the long-term success that stems from customer satisfaction.

Sales and Marketing:

The sales and marketing departments within an organization are closely linked.

While the marketing function within an organization aims to establish the requirements of actual and prospective customers and promoting the company's

products or services, the sales department actively sells the company's products to customers.

The fundamental distinction between the two departments is that the marketing department's efforts cost the organization expenses whereas the sales department generates revenue to the company.

Finance and Administration:

Activities:

- Properly manage the resources from international organizations and foreign funding sources.
- Develop and monitor the implementation of the annual budget of the Organization.
- Observe and enforce the regulations of the Organization.
- Establish processes for the compliance of the Organization's regulations.
- Manage the assets of the Organization.

Research and development:

Research and development is the process by which a company works to obtain new knowledge that it might use to create new technology, products, services, or systems that it will either use or sell.

This strategy can lead to innovation and increased productivity and can boost your business's competitive advantage.

b) Explain that the following organizations (Microsoft, IBM, eBay, Amazon) are centralized or decentralized. Also justify your answer

Ans) Microsoft is a clear example of a centralized company. A centralized company is a company which relies on one individual, central person to make all the decisions of the company and direct the company.

IBM is also centralized because all of its decisions are relied on one individual.

eBay is an example of an organization that has landed on the sweet spot. It has centralization: eBay requires people to log on, and buyers and sellers must identify themselves. It has decentralization: users can auction items to each other directly, buyers and sellers rate each other. This combination creates both trust and security.

In a centralized world, Amazon grows its current 9% e-commerce market share to a much larger percentage, taking advantage of its scale, efficiency, advanced technology, and the convenience of shopping in one place. So, Amazon is centralized company.

Question No: 02
 a) **Explain limited and unlimited companies. Also list 3 limited and unlimited Companies in Pakistan.**

Ans) Limited company:

A limited company is a type of business structure where the company has a legal identity of its own, separate from its owners (shareholders) and its managers (directors). Even if a company has only one individual involved with it and that person is the only shareholder and the only director, the company is still a separate legal entity.

That means the company can enter into contracts, and be sued, in its own right. In the event that the company is sued, its directors and shareholders do not have to sell their own assets to pay the debt, unless, in the case of directors, they have been found guilty of wrongdoing or have given personal guarantees.

Unlimited company:

An unlimited company is very much like a regular private company limited by shares. It must be registered with Companies House and have a memorandum and articles of association. There's a director that manages the day-to-day running of the company on behalf of the shareholders. Persons of significant control and an annual confirmation statement must still be submitted to Companies House.

Limited companies in Pakistan:

1) Ittehad chemical LTD Lahore.
2) Linde Pakistan limited Karachi.
3) ICI Pakistan limited Multan.

Unlimited companies in Pakistan:

1) Pakistan International Airlines Corporation
2) CyberNet
3) State Life Insurance Corporation of Pakistan

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b) While starting a new software company as fresh graduates, what are the two main sources of funds that can help you to start your company? Explain briefly.

Ans) The two main sources of funds that can help you to start your company are:

1: Seed Funding

Seed funding is the initial startup funding you get for your business. It can be around $50,000 or $500,000 depending on how convincing presentation you make and the amount you require to take your business off the ground. The problem is, this is one of the riskiest investments.

Because you can't prove that your business will survive. If it survives, your investors will be able to double their money in just a few years, and if it fails, they will lose all their hard-earned money in months.

For this article, we will assume that the startup will survive. And, if it does for at least two years, you will be eligible to get series A funding.

2: Series Funding

a. Series A

You are now out of money. You have given a share of 10% to your father for the seed funding. Now, you need to get more cash to get things one level up. You will

connect with venture capital (VC) firms and angel investors to get more investment. This type of investment is much bigger than what you were aiming initially. It can run from a couple of hundred thousand dollars to millions of dollars. But you will have to give a share of your company to the new investors.

Let's say that you gave 10% to your father through the seed funding. But now that you have more investment coming in through the Series A funding, you will have to dilute the shares. Here is how it will work:

Initial company value = $300,000

Father's share (seed funding) = $30,000 = 10%

For Series A funding you get one million dollars from a VC firm. Now the company share will be like this:

Company value = $1 million + $300,000 + = $1.3million + post-funding value = $ 3 million

Note: You don't have $1.7 million but you assume that by getting the funding for startup from investors your company's value will increase.

Now you will bargain with VC firm to get 30% value in your company for one-million-dollar funding. Therefore, now the startup will release shares, diluting the previous share value.

Let's assume that there are 100,000 shares of your company, with each share worth $3. Now, to give 30% of the company to the new shareholders, the company will release more shares. The initial 100,000 shares will shrink down to 70% of the total company value. To complete it, you will release 42,857 more shares of 30% company value. The number of new shares will be 142,857. It also means that the company's share value will increase to $21.

Therefore, your father doesn't hold 10% company value. But guess what? His share value has increased from $3 to $21. Hence, your father's current share value is $210,000 instead of $30,000 that he gave you two years ago.

b. Series B

Similarly, your company can opt for series B funding after four to five years of operations - when it deems suitable. In many cases, companies don't opt for series

B funding because they tend to become profitable after five years or so. This startup funding is usually in double-digit million figures starting around 10 million for basic funding round.

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Question No: 03

a) **What is intellectual property? Write and explain three ways that protect Intellectual property.**

Ans) Intellectual property:

Intellectual property is an umbrella term for a set of intangible assets or assets that are not physical in nature. Intellectual property is owned and legally protected by a company from outside use or implementation without consent. Intellectual property can consist of many types of assets, including trademarks, patents and copyrights.

Trademarks

Trademark registration is one of the most common, and straightforward, types of intellectual property protection. Trademarks are usually registered for logos and branding. You have the right to any mark you use to distinguish your company or product the minute you start using it to market, as long as no one else had already claimed that mark.

Registering a trademark with the USPTO makes it a lot easier to enforce your rights to that mark. If someone outside of your home state starts using your logo, for instance, it can be hard to enforce your IP rights without registering. When you start using any sort of unique logo, phrase, symbol, design, or packaging to market your product or service, be sure to register it.

Copyrights

Copyrights are a little different from patents and trademarks. One of the biggest differences lies in that there is an office that deals solely with copyright registration. But beyond that, copyright law is meant to protect original, creative works -- stuff like music, drama, literature, and art. So if you come up with a jingle to use during commercials, you have a right to its use. You can even file to protect a logo, if it is seen as having enough artistic merit to warrant copyright protection.

Any business built on creativity -- like a custom jewelry shop -- should register a copyright for any designs used. Some businesses will also copyright their website's content. Like trademarks, the author or creator of any work does have copyright protection the minute the work is created. If you ever want to enforce a copyright, you need to register with the US Copyright Office first.

Patents

Patents are one of the most well-known forms of intellectual property protection and are also notoriously hard to get.

There are two main types of patents, utility patents and design patents. Utility patents are issued to protect novel, useful inventions, while design patents protect the unique appearance of a functional object -- like the design of a soda bottle. If your business is built on a patentable idea, I recommend you meet with a patent lawyer to make sure your application is filled out properly so it won't be rejected for any mistakes. The USPTO takes its time issuing patents, so the more polished your application, the better.

b) **What is the difference between European directive and U.S directive on data protection?**

Ans) The Data protection laws of the EU

In the EU, two main legal instruments regulate the data protection in the information society. These legal instruments include the Data Protection Directive 1995/46/EC and the e-Privacy Directive 2002/58/EC.

Data Protection in the US

Unlike the EU, the US does not have a single overarching privacy law. On a federal level, the United States maintains a sectoral approach towards data protection legislation where certain industries are covered and others are not. At a state level, most states have enacted some form of privacy legislation. Below, we quickly discuss three important federal data protection laws, namely, the Health Insurance Portability and Accountability Act (HIPAA), the Fair and Accurate Credit Transaction Act (FACTA), and the Children's Online Privacy Protection Act (COPPA).

Conclusion

Under EU law, personal data can be collected only under strict conditions and for a legitimate purpose. The main component of the EU data protection law is the Data Protection Directive 1995/46/EC.
In the US, there is no all-encompassing law regulating the collection and processing of personal data. Instead, data protection is regulated by many state and federal laws.

The different approaches of the EU and US towards data protection probably stem from history. In Europe, where people have had dictatorships, data protection is declared as a human right and regulated by comprehensive data protection legislation. In this regard, it is worth mentioning that the STASI, the official state security service of the German Democratic Republic or GDR (informally known as East Germany), employed 500,000 secret informers. The task of 10,000 of these informers was to listen to and transcribe the phone calls of citizens. In contrast, in the US, the attitude towards data protection is governed mainly by market forces. It should also be noted that with the adoption of the US Patriot Act, which was adopted in response to the events on September 11, 2001, the US significantly reduced the restrictions in the collection of personal data by law enforcement agencies.

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Question No: 04
a) What is contract? Explain the main purpose of contract?

Ans) Contract:

A contract is a legal agreement between two or more parties.

 Or contracts set out the agreement between the parties like:

- They set out the aims of the parties;
- Ways of terminating the contract and the consequences of termination.

Where there are gaps in the agreement because the parties have failed to complete a particular issue, it is a function of contract law to fill them, for example contract law provides rules for the termination of the contract if performance becomes impossible.

It is important that:

- A contract is set in a clear and logical manner;
- A contract is complete and consistent;
- And the parties to the agreement should be left in no doubt as to their rights and duties. Software engineers are likely to come across many different types of contract like:
- Insurance contracts;
- Contracts of employment;
- Contracts with hardware suppliers and so on.

b) What is pen-testing? Explain three methodologies of penetration testing used by ethical hackers.

Ans) Penetration testing:

In simple terms (although the actual testing can be quite complex a Pen Test examines any weaknesses in the IT infrastructure of a corporation by trying to discover and exploit them, in a safe manner.

These vulnerabilities can be found in the software itself at these particular points of entry:

- Backdoors in the Operating System;
- Unintentional flaws in the design of the software code;
- Improper software configuration management implementation;
- Using the actual software application in a way it was not intended to be used

Methodologies of Penetration testing:

- Black Box Testing;
- White Box Testing;
- Gray Box Testing.

Black Box Penetration Testing

In this type of Pen Test, there is no information given to the tester about the internal workings of the particular Web Application, nor about its source code or

software architecture. As a result, this particular type of test can take a very long time to complete, so very often, the tester will rely upon the use of automated processes to completely uncover the weaknesses and vulnerabilities. This type of test is also referred to as the "trial and error" approach.

White Box Penetration Testing

In this type of Pen test, also known as "Clear Box Testing," the tester has full knowledge and access to both the source code and software architecture of the Web Application. Because of this, a White Box Test can be accomplished in a much quicker time frame when compared to a Black Box Test. The other advantage of this is that a much more thorough Pen Test can be completed.

Gray Box Penetration Testing

As the name implies, this type of test is a combination of both the Black Box and the White Box Test. In other words, the penetration tester only has a partial knowledge of the internal workings of the Web Applications. This is often restricted to just getting access to the software code and system architecture diagrams.

With the Gray Box Test, both manual and automated testing processes can be utilized. Because of this approach, a pen tester can focus their main efforts focus on those areas of the Web Application, which he or she knows the most about, and from there, exploit any weaknesses or vulnerabilities. With this particular method, there is a higher probability that harder to find "security holes" will also be discovered as well.