

Professional Practice Papers Notes

1. Introduction to IT?

(i) What is IT?

Ans: Information Technology (IT) describes any technology that helps to produce, manipulate, store, communicate, &/or disseminate information. Typically, IT is used in the context of business operations, as opposed to technology used for personal or entertainment purposes. The commercial use of IT encompasses both computer technology & telecommunication.

(ii) ~~How~~ is IT usage of IT in different walks of life?

(i) Health:

Telemedicine: Medical care via telecommunications lets doctors treat patients from far away. 3D computer models allow accurate tumor location inside a skull. Robots permit precise microsurgery. Handheld computers allow patients to measure blood sugar.

(ii) Money:

Virtual means something that is created, simulated, or carried on by means of a computer or a computer network.

- virtual airline tickets

- Virtual money.

- online bill paying, PayPal, Electronic Payroll deposit, MicroPayments for online music.

(iii) Business:

Whether you work in a large or small business, information technology is going to play a large role in your day-to-day tasks. Businesses tend to use IT in three main ways: to support basic information processing tasks, to help with decision-making, & to support innovation.

(iv) Society:

As a society, we have taken the steps to embrace IT more than ever before. We see it almost everywhere, but especially with online education, social networks, Smart Phone, job creation, agriculture, & entertainment. IT is also bringing society leaps & bounds ahead of communicating & having relationships with others.

(v) Jobs & career: When it comes to growing careers, jobs (IT) are skyrocketing. The field of IT encompasses a wide range of career paths, with some being more popular than others. Responsibilities range from keeping systems & data secure to making sure networks are up & running. No matter the role, those who work in IT need to be able to solve technology problems, both big & small.

Popular IT Jobs:

- Technical Support • Programmer • Web Developer
- Computer Systems Analyst • Network Engineer
- IT Security • Software Engineer

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3. Medium & technologies used in IT?

Ans: Medium technology is any hardware, software or tool that is used to compose, create, produce, deliver & manage media including audio, video, images, information, interactive media, video games, virtual reality & augmented reality environments.

(i) worldwide web (WWW):

The multimedia Part of the internet an interconnected system of servers that support specially formatted documents in multimedia form includes text, still images, moving images, sound responsible for the growth & popularity of the internet.

(ii) Cyberspace:

Term coined by William Gibson in Neuromancer (1984). Described a futuristic computer network people "plugged" into directly with their brains.
Now means:

- The web • chat rooms • online diaries (blogs) • The wired & wireless communications world.

Latest Technologies trend:

1. Artificial intelligence
2. Data Science
3. Internet of things
4. Blockchain
5. Robotic Process Automation (RPA)
6. Virtual Reality
7. Edge computing
8. Intelligent APPs.

4. Types of Computers: There are 7 types of computers.

1. Supercomputer: Are the fastest & most expensive computers. These huge computers are used to solve very complex science & engineering problems. A typical Supercomputer can do up to ten trillion individual calculations every second.

2. Mainframe: (colloquially, "big iron") computers are similar to Supercomputers in many aspects, the main difference b/w them is the fact that a Supercomputer uses all its raw to focus on very few tasks, while a mainframe perform thousands or millions of operations concurrently.

3. Server Computer: A server is a central computer that contains collections of data & programs. Also called a network server, this system allows all connected users to share & store electronic data & applications. Two important types of servers are file servers & application servers.

4. Microcontroller:

Are mini-computers that enable the user to store data & execute simple commands & tasks. Many such systems are known as embedded systems. The computer in your car, for example, is an embedded system. A common micro controller that one might come across is called Arduino.

5. Workstation Computer:

Are high-end, expensive computers that are made for more complex procedures & are intended for one user at a time. Some of the complex procedures consist of science, math & engineering calculations & are useful for computer design & manufacturing. Workstations are sometimes improperly named for marketing reasons.

6. Personal Computer (PC):

It is also known as Microcomputer. Its physical characteristics & low cost are appealing & useful for its users. The capabilities of a personal computer have changed greatly since the intro of electronic computers. Today a PC is an all-around device that can be used as productivity tool, a media server & a gaming machine.

7. SmartPhone:

A smartphone is a mobile device that combines cellular & mobile computing functions into one unit. They are distinguished from feature phones by their stronger hardware capabilities & extensive mobile operating systems, which facilitate wider software, internet (including web browsing over mobile broadband), & multimedia functionality (including music, video, cameras, & gaming), alongside core phone functions such as voice calls & text messaging.

5. Future of IT?

Ans: Career Path in the IT industry can be broadly ~~can~~
~~be~~ classified into the two main fields of hardware
& software. IT is growing tremendously with every
passing year. However, there is no denial of the fact
that this stream is not devoid of challenges. Most
companies use information technology widely & IT
professionals continue to be in great demand, especially
those with good skills, talent, & aptitude.

2. Professional activities & their role in Society.

1. What is Professionalism & activities, social duties, &
is why important?

Ans: "The skill, good judgment, & polite behavior that
is expected from a person who is trained to do a
job well".

"Professionalism" is commonly understood as an
individual's adherence to a set of standards, code
of conduct or collection of qualities that characterize
accepted practice within a particular area of activity!"

• Why is important:

Dedication, integrity & responsibility are
elements of professionalism that make a person
successful in her field.

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• Activities:

You perform "Professional activity" of a type carrying high individual responsibility, requiring application of special skills to activities that are predominantly intellectual & varied rather than routine & normal.

• Social duty:

You have a "Social duty" fulfilled through guarding the ideals & standards of the profession, by advancing it, by sharing advances, by rendering gratuitous public service, all as a return to society.

• Characteristics:

Professionalism includes a variety of personal qualities & behaviors that demonstrate commitment to effective performance in a given job. Commitment & confidence, responsibility & dependability, honesty & ethics, & appearance & professional presence are central professional characteristics.

2. Trials of Professionalism?

Ans: Most professional software engineers adopt an institutional view of the organizations of the profession: they perceive them as bodies representing the profession & therefore deserving, even requiring, the loyalty of each software engineer as an expression of his identity as a professional software engineer.

There are 4 traits.

- (i) Varied activities requiring Special Skills
- (ii) Society - critical motivation.
- (iii) Personal standards of excellence.
- (iv) Giving back to Society.

Ten traits of Successful Professionals

1. Seriousness:

Serious about job. The job is only a job. A means to an end.

2. Wanting to do better:

Exhibit a never-ending request to improve their performance in every variable, every project, every relationship, & every detail.

3. Dealing with the Unexpected:

Stuff happens, things change, & the true professional rises to the occasion.

4. Communication skills:

No matter what the industry or job description, communication skills are critical to today's workplace. Real professionals are clear, concise & confident in their communication skills.

5. Enthusiasm:

Attitude is everything. Those who exhibit enthusiasm for what they do & greet each day with a positive attitude inevitably become a leader.

6. Helpfulness:

Professionals understand that real success in the workplace requires teamwork. So they are always ready to lend a hand, make a suggestion, & offer a compliment when it's deserved.

7. Taking the Initiative:

To things alone.
8. Cool Under Pressure:

True Professionals never Point Fingers. They remain Level headed & calm, with a cheerful demeanor even under stressful times.

9. Remains focused:

Stay focused on the task at hand & the goal ahead. Navigate through obstacles or setbacks but never lose sight of where they headed.

10. Don't follow, Lead:

True Professionals aren't afraid of heart. Analyze the situation & willing to take new path's & try new solutions. That's why they call it leadership!

3. IEEE Code of Ethics?

Ans: we, the member of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, & in accepting a personal obligation to our profession, its members & the communities we serve, do hereby commit ourselves to the highest ethical & professional conduct & agree:

• Actions:

- (i) Public - Software engineers shall act consistently with the Public interest.
- (ii) Client & ~~Employer~~ Employer - Software Eng: Shall act in a manner that is the best interests of their client & employer consistent with the Public interest.

• Products:

- (iii) Software engineers shall ensure that their Products & related modifications meet the highest Professionals standards possible.

• Hierarchy:

- (iv) Judgment - Software engineers shall maintain integrity & independence in their Professional judgment.

- (v) Management - Software engineer managers & leaders shall subscribe to & promote an ethical approach to the management of software development & maintenance.

• Peers:

- (vi) Profession - Software Eng: shall advance the integrity & reputation of the Profession consistent with the Public interest.

- (vii) Colleagues - Software Eng: shall be fair to and supportive of their colleagues.

• Self:

- (viii) Self - Software Eng: shall Participate in lifelong learning regarding the practice of their Profession & shall Promote an ethical approach to the practice of the Profession.

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8- Principles of IEEE Code of Ethics:

1. Act in Public interest.
2. Act on interest of clients & employers.
3. Produce Quality Products.
4. Maintain independent judgment.
5. Manage ethically.
6. Protect integrity of Profession.
7. Support colleagues.
8. Pursue Lifelong learning.

4. ACM Code of Ethics:

The ACM Code of Ethics expresses the conscience of the computing profession, and it affirms an obligation of computing professionals both individually & collectively to use their skills for the benefit of society.

(i) General Ethical Principles:

A computing professional should

1. Contribute to Society & human well-being.
2. Avoid harm to others.
3. Be honest & trustworthy.
4. Be fair & take action not to discriminate.
5. Honour Property rights, including copyrights & Patents.
6. Give proper credit for intellectual property.
7. Respect the Privacy of others.
8. Honour Confidentiality.

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(ii) Professional leadership Principles.

A computing Professional, especially one acting as a leader, Should:

1. Ensure that the Public good is the central concern during all Professional computing work.
2. Articulate, encourage acceptance of, & evaluate fulfillment of Social responsibilities by members of the organization or group.
3. Manage Personnel & resources to enhance the quality of working life.
4. Articulate, apply, & support Policies & Processes that reflect the Principles of the code.
5. Create opportunities for members of the organization or group to grow as Professionals.
6. Use care when modifying or retiring Systems.
7. Recognize & take special care of systems that become integrated into the infrastructure of society.

(iii) Professional Responsibilities:

A computing Professional should

1. Strive to achieve high quality in both the processes & products of professional work.
2. Maintain high standards of professional competence, conduct, & ethical practice.
3. know & respect existing rules pertaining to professional work.
4. Accept & provide appropriate professional review.
5. Give comprehensive & thorough evaluations of computer systems & their impacts, including analysis of possible risks.

6. Honour contracts, agreements, & assigned responsibilities.
7. Improve public understanding of computing & its consequences.
8. Access computing & communication resources only when authorized to do so.

(iv) Compliance with the Code.

1. Uphold & promote the principles of this code.
2. Treat violations of this code as inconsistent with membership in the ACM.

3. Hacking, Ethical Hacking & Cybersecurity?

1. Ethical Hacking:

Involves an authorized attempt to gain unauthorized access to a computer system, application, or data. Carrying out an ethical hack involves duplicating strategies & actions of malicious attackers.

• How is useful?

The objective of Ethical Hacking to enhance the security of the system or a network by fixing the weak points & vulnerabilities they were identified during the testing. There are professionals involved in Ethical Hacking & are known as ethical hackers.

• Example

The practice of breaking into, or by passing an online system or network in order to expose its flaws for further improvement is entirely ethical (& you can

make a nice living doing it too.). Example of ethical hacking include exploiting exposing a website in order to discover its weak points.

- Purpose/Benefits:

The Purpose of ethical hacking is to evaluate the security of & identify vulnerabilities in target systems, networks or system infrastructure.

- Why is important

Ethical hacking is used to secure important data from enemies. Ethical hacking can ensure the safety of the nation by preventing cyber-terrorism & terrorist attacks.

- Types of Hackers:

There are three types of Hackers are the white hat hacker, the grey hat hacker, & the black hat hacker. Each type of hacker hacks for a different reason, a cause, or both. All have the required skills needed to accomplish their mission.

2. Cyber Security:

Is the application of technologies, processes & controls to protect systems, networks, programs, devices & data from cyber attacks. It involves creation of policies, methodologies & techniques needed to safeguard data from unauthorized access.

Cybersecurity is the most important requirement in today's digital world.

(i) Creates security policies.

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- (ii) Oversees Risk Register (Again)
- (iii) Analysis new technology
- (iv) Hand-in-Plan with ethical Hacking.

• Who uses?

Cybersecurity is the protection of internet-connected Systems such as hardware, software & data from cyber threats. The Practice is used by individuals & enterprises to protect against unauthorized access to data centers & other computerized systems.

• Example?

Examples of network security includes Antivirus & Antispyware programs, firewall that block unauthorized access to a network & VPNs (Virtual Private Networks) used for secure remote access.

• Types

In this article, we will observe five types of cybersecurity techniques, which will help in reducing the cyber attack amongst enterprises & organization.

1. Critical infrastructure Cybersecurity
2. Network Security
3. Cloud Security
4. Internet Of Things Security
5. Application Security.

- What kinds OF Jobs?

- Cyber Security careers
- 1. cyber security specialists
- 2. Information security, Cyber security or vulnerability analysis.
- 3. Security or cyber security Engineers
- 4. Cyber security technical architects.
- 5. Security or cyber security technicians
- 6. Security or cyber security principals.
- 7. Security or cyber security administrators.

- Why is Important?

In today's connected world, everyone benefits from advanced cyberdefense programs. At an individual level, a cybersecurity attack can result in everything from identity theft, to extortion attempts, to the loss of important data like family photos. Everyone relies on critical infrastructure like power plants, hospitals, & financial service companies. Securing these & other organizations is essential to keeping our society functioning. They reveal new vulnerabilities, educate the public on the importance of cybersecurity, & strengthen open source tools. Their work makes the internet safer for everyone.

4. Misuse of IT & their risks ?

1. What is Misuse of IT?

Ans: Misuse of information & communications technology (ICT) includes theft of hardware & software, unauthorised access to computer systems & inappropriate use of equipment.

Data misuse is the inappropriate use of data as defined when the data was initially collected.

Misuse of information typically is governed by laws &/or corporate cybersecurity policies.

• Misuse of Internet

Internet abuse refers to improper use of the internet & may include: cyberbullying, use of the internet to bully & intimidate, cybercrime, uses of computers in criminal activity, cybersex trafficking, the live streaming of coerced sexual acts & rape.

• Why is technology Misused?

Because of hundreds of services that technology offers there are many techniques to harm persons & waste time, people use their time to harm others even though they know that is not good. for example, people manufactures use it as weapons to destroy others instead of improving themselves.

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• Types:

• Example Of Misuse?

Examples of misuse of information technology outside of the workplace include: illegal downloading of copyrighted materials. Viewing or downloading child Pornography, Etc. Transmission of offensive or harassing statements, just to name a few.

5. Social responsibilities of an IT Professional?

Ans: Social responsibility is an ethical framework & suggest that entity, be it an organization or individual, has an obligation to act for the benefit of society at large.

Spread your knowledge
A major social contribution of IT Professionals is the sharing of knowledge & skills through voluntary participation in professional organizations, Seminars, conferences, user groups, standards organizations, advisory groups, one-on-one consultations, etc.

• Types:

Corporate social responsibility is traditionally broken into four categories:

1. Environment Responsibility
2. Ethical Responsibility

3. Philanthropic Responsibility.
4. Economic Responsibility.

- Example

Working for the community, such as volunteering, giving blood donations, & working at a food bank or animal shelter. Supporting issues that affect society, such as advocating political or social issues that can help others. For example, advocating for child labor laws, purchasing fair trade products, recycling.

- Why is it important:

Social responsibility means that business, in addition to maximizing shareholder value, should act in a manner that benefits society. Society responsible companies should adopt policies that promote the well-being of society & the environment while lessening negative impacts on them.

- Purpose:

The purpose of corporate social responsibility is to give back to the community, take part in philanthropic causes, & provide positive social value. Business are increasingly turning to CSR to make a difference & build a positive brand around their company.