LET US REVISE

- A digital footprint is a trail of data you create while using the Internet. It includes the websites you visit, emails you send, and information you submit to online services.

- **Intellectual property rights** are the rights of the owner of information to decide how much information is to be exchanged, shared or distributed ; and to decide the price for doing (exchanging/sharing/distributing) so.

- **Plagiarism** is stealing someone else's intellectual work and representing it as your own work without giving credit.

- **Digital property** (or **digital assets**) refers to any information about you or created by you that exists in digital form, either online or on an electronic storage device.

- OSS refers to Open Source Software, which refers to software whose source code is available to customers and it can be modified and redistributed without any limitation. An OSS may come free of cost or with a payment of nominal charges that its developers may charge in the name of development, support of software.

- FLOSS refers to Free Libre and Open Source Software or to Free Livre and Open Source Software. The term FLOSS is used to refer to a software which is both **free software** as well as **open source software**. Here the words **libre** (a Spanish word) and **livre** (a Portuguese word) mean **freedom**.

- Phishing is the practice of attempting to acquire sensitive information from individuals over the internet, by means of deception.

- Hacking refers to gaining unauthorised access to a network or computer or digital files, with an intention to steal or manipulate data or information or to install malware.

- Licenses are the permissions given to use a product or someone's creation by the copyright holder.

- A copyright is a legal term to describe the rights of the creator of an original creative work such as a literary work, an artistic work, a design, song, movie or software etc.

Objective Type Questions

OTQs

Multiple Choice Questions

1. A software that can be freely accessed and modified is called _____ .
   - (a) Synchronous Software
   - (b) Package Software
   - (c) Open Source Software
   - (d) Middleware

2. Data which has no restriction of usage and is freely available to everyone under Intellectual Property Rights is categorised as : [CBSE D 20C]
   - (a) Open Source
   - (b) Open Data
   - (c) Open Content
   - (d) Open Education

3. Which of the following is an advantage of 'open source' software ?
   - (a) You can edit the source code to customise it.
   - (b) You need to be an expert to edit code.
   - (c) You have to pay.
   - (d) Can sometimes be too generic for specialist purposes.

4. Which of the following is a disadvantage of 'open source' software ?
   - (a) High quality software with lots of features

    (b) Not as customizable

    (c) May not have been tested as much as proprietary software, so might have bugs.

    (d) You can edit the source code to customise it

5. Which of the following is an advantage of 'proprietary' software ?

    (a) It is usually free.

    (b) Thoroughly tested because people are paying to use it.

    (c) Not as customizable

    (d) Can sometimes be too generic for specialist purposes

6. Which of the following is a disadvantage of 'proprietary' software ?

    (a) You need to be an expert to edit code.

    (b) You have to pay for this type of software.

    (c) It's licensed.

    (d) It is launched after proper testing.

7. The generally recognized term for the government protection afforded to intellectual property (written and electronic) is called _____ .

    (a) computer security law
    (b) aggregate information

    (c) copyright law
    (d) data security standards

8. Which of the following would be a creative work protected by copyright ?

    (a) A list of all Indian President names

    (b) A portrait of your family

    (c) A song you wrote

    (d) The name of your pet dog

9. Which of the following is not a type of cybercrime ?

    (a) Data theft
    (b) Forgery

    (c) Damage to data and systems
    (d) Installing antivirus for protection

10. Which of the following is not done by cyber criminals ?

    (a) Unauthorized account access

    (b) Mass attack using Trojans as botnets

    (c) Email spoofing and spamming

    (d) Report vulnerability in any system

11. What is the name of the IT law that India is having in the Indian legislature ?

    (a) India's Technology (IT) Act, 2000

    (b) India's Digital Information Technology (DIT) Act, 2000

    (c) India's Information Technology (IT) Act, 2000

    (d) The Technology Act, 2008

12. What is meant by the term 'cyber-crime' ?

    (a) Any crime that uses computers to jeopardise or attempt to jeopardise national security

    (b) The use of computer networks to commit financial or identity fraud

    (c) The theft of digital information

    (d) Any crime that involves computers and networks

13. What is an example of e-waste ?
    (a) a ripened banana
    (c) old clothes
    (b) an old computer
    (d) empty soda cans

14. An organisation purchases new computers every year and dumps the old ones into the local dumping yard. Write the name of the most appropriate category of waste that the organisation is creating every year, out of the following options :
    (a) Solid Waste
    (c) E-Waste
    (b) Commercial Waste
    (d) Business Waste   [CBSE D 20C]

15. A software company purchases new computers every year and discards the old ones into the local dumping yard. Write the name of the most appropriate category of waste that the organisation is creating every year, out of the following options :
    (a) Business Waste
    (c) Solid Waste
    (b) Commercial Waste
    (d) E-Waste   [CBSE D 20C]

16. The rights of the owner of information to decide how much information is to be shared/exchanged/distributed, are collectively known as _____ (IPR).
    (a) Intelligent Property Rights
    (c) Interactive Property Rights
    (b) Intellectual Property Rights
    (d) Instance Property Rights

17. Stealing someone else's intellectual work and representing it as own, is called _____ .
    (a) Intellectual steal
    (c) Plagiarism
    (b) Pluckism
    (d) Pickism

18. The information/art/work that exists in digital form is called _____ .
    (a) e-work
    (c) digital property
    (b) e-asset
    (d) e-property

19. Every activity you perform on the Internet is saved for how long ?
    (a) one month
    (c) as per my setting
    (b) one year
    (d) forever

20. The digital trail which gets created as a person's Internet usage using computers, smartphones, gaming consoles etc. is called _____
    (a) Internet data
    (c) Digital footprint
    (b) Internet trail
    (d) e-footprint

21. Gaining unauthorised access to a network or computer or digital files with malicious intentions, is called _____
    (a) Cracking
    (c) Banging
    (b) Hacking
    (d) Phishing

22. Legal term to describe the rights of a creator of original creative or artistic work is called _____
    (a) Copyright
    (c) GPL
    (b) Copyleft
    (d) none of these

Fill in the Blanks

1. OSS stands for _____ .

2. Any fraudulent business practice that extracts money from an unsuspecting, ignorant person is called a _____ .

3. _____ is stealing someone else's intellectual work and representing it as your own without giving credit.

4. Any work/information that exists in digital form either on Internet or on an electronic device, is known as _____ property.

5. Discarded electrical or electronic devices are known as _____ .

6. The least restrictive open source license is _____ license.

7. The original code written by programmers for a software is known as _____ .

8. _____ means no price is to be paid for the software.

9. _____ _____ means freedom to use the software.

10. IAD means _____ _____ _____ .

11. The _____ _____ is the digital trail of your activity on the Internet.

12. The _____ are the permissions given to use a product or someone's creator by the copyright holder.

13. _____ is a license that gives rights opposite to copyright.

14. The practice of taking someone else's work or ideas and passing them off as one's own is known as _____ .   [CBSE Sample Paper 2020-21]

15. A _____ _____ _____ is an injury or disorder of the muscles, nerves, tendons, ligaments and joints.

16. _____ _____ _____ is a technology related health condition affecting eyesight.

True/False Questions

1. Open Source Software can be used for commercial purposes.

2. It is okay to copy and paste information from the Internet into your report then organize it.

3. Shareware software allows you to try the software before you buy it.

4. Freeware is copyrighted software that is freely available to use.

5. Cyber-laws are incorporated for punishing all types of criminals only.

6. Deceptively attempting to acquire sensitive information of someone else using online means, is a cybercrime.

7. Freeware and free software mean the same thing.

8. Excessive use of Internet and social media is termed as a disorder.

9. Digital footprint can be deleted.

10. Digital footprint remains forever.

11. It is safe to make all one posts public on social media.

12. Hacking is performed to help find the security loopholes.

13. If you post something mean about someone, you can just delete it and your activity will be undone.

14. Hacking is a cybercrime.

15. Copyright is the right of the creator of creative/artistic work.

NOTE : Answers for OTQs are given at the end of the book.

Solved Problems

1. *What is digital footprint ?*

Solution. A digital footprint is the record or trail left by the things one does online. The social media activity, the information on personal website, the browsing activities, online subscriptions, any photo galleries and videos uploaded by a user — essentially, any activity carried out on the Internet makes the digital footprint of a user.

2. *Why is it important to have positive digital footprint ?*

Solution. It is very important to have a clean and secure digital footprint because :

- It gives us a digital persona by defining our online behaviour.
- The digital footprint is often used by universities before approving admissions to a student.
- The digital footprint is also used by future employers, and law enforcement offices, to find people with positive and clean digital footprint.
- The digital footprint should not provide personal information as it could be misinterpreted or misused for theft of identity.

3. *What are intellectual property rights ?*

Solution. **Intellectual property rights** are the rights of the owner of information to decide how much information is to be exchanged, shared or distributed. Also it gives the owner a right to decide the price for doing (exchanging/sharing/ distributing) so.

4. *Why should intellectual property rights be protected ?*

Solution. The intellectual property rights must be protected because protecting them

- encourages individuals and businesses to create new software and new software applications, as well as improving existing applications,
- ensures new ideas and technologies are widely distributed,
- promotes investment in the national economy.

5. *What do you understand by plagiarism ? Why is it a punishable offence ?*

Solution. Plagiarism is the act of using or stealing someone else's intellectual work, ideas etc. and passing it as your own work. In other words, plagiarism is a failure in giving credit to its source.

Plagiarism is a fraud and violation of Intellectual property rights. Since intellectual property holds a legal entity status, violating its owner's right is a legally punishable offence.

6. *What is digital property ? Give some examples of digital properties.*

Solution. Digital property (or digital assets) refers to any information about you or created by you that exists in digital form, either online or on an electronic storage device.

Examples of digital property include : **any online personal accounts (email/social media accounts/ shopping accounts/video gaming accounts, online storage accounts) and personal websites and blogs ; domain names registered in your name; intellectual properties etc.**

7. *What is Identity theft ? Give example.*

Or

What do you mean by Identity theft ? Explain with the help of an example. [CBSE Sample Paper 2020-21]

Solution. Identity theft occurs when someone uses another person's personal identifying information and pretends to be that person in order to commit fraud or to gain other financial benefits.

The imposter can steal and use identifying information such as full name, home address, email address, online login and passwords, driver's license number, passport number, or bank account number etc. Once thieves access this information, they may use it to commit identity theft.

For example, using stolen credit card information, identity thief may go on shopping spree or using stolen online identity, they may send fraudulent mails or even ask for some money in the name of help (on behalf of stolen identity).

8. *Describe the terms free software and open source software. Write examples of one Proprietary and one OSS Software.*

Solution. *Free software* is the software free of cost, which can be copied, modified and redistributed as well but whose source code is not available. *Open source software*, on the otherhand, is the software, whose source code is available and which can be copied, modified and redistributed as well. There may or may not be charges payable for open source software.

Open Source Software : Linux ;   *Proprietary Software* : Microsoft Windows 8.

9. *Expand the following terms :* (i) *OSS* (ii) *SDLC* (iii) *GNU* (iv) *FLOSS*

Solution.

  (i) **OSS.** Open Source Software.

  (ii) **SDLC.** System Development Life Cycle.

  (iii) **GNU.** GNU is Not Unix.

  (iv) **FLOSS.** Free Libre/Livre and Open Source Software.

10. *Mr. Jayanto Das is confused between Shareware and Open source software. Mention at least two points of differences to help him understand the same.*

Solution. **Shareware** is software, which is made available with the right to redistribute copies, but it is available for limited time, often after a certain period of time, then a license fee should be paid.

Shareware is not the same thing as *free and open source software* (FOSS) for *two* main reasons :

  (i) the source code is not available and,   (ii) modifications to the software are not allowed.

OSS refers to *open source software*, which refers to software whose source code is available to customers and it can be modified and redistributed without any limitation. An OSS may come free of cost or with a payment of nominal charges that its developers may charge in the name of development, support of software.

11. *Would you suggest open source software (OSS) for an organization or sector where the performance is the factor of utmost importance, such as Military ?*

*You must be aware that military has different software needs than the commercial sector because of its unique mission and environment. While **commercial sector** chooses software on the basis of factors like : application choice, ease of use, service and support, price, reliability and performance, **the military** does the same depending upon factors like : reliability, long-term supportability, security, scalability and performance of the software.*

Keeping in mind the above scenario, answer the above question with a proper justification. Give example of a software, if you are recommending one.

Solution. The open source software comes with characteristics like : availability of open source, no license restriction on type of usage, freedom to modify, redistribute etc. But all these characteristics are not enough to be suggested as a preferred software. Not all the OSS provide long-term support or are secure-enough or scalable. Therefore, we can not blindly recommend any OSS software. The same applies to proprietary software as well.

Therefore, we can recommend only those software to Military that have su...
form of *community-development-groups* etc. and that have features like *security, scalability* and
performance along with it. Thus, the OSS software suite like LAMP (*Linux, Apache, MySQL, PhP*) that
has all the above mentioned features can be recommended to Military.

12. List a table of differences between Free software and Open source software.

Solution.

Free Software	Open Source Software
❖ Freedom to run program for any purpose	❖ It has distribution of license.
❖ Freedom to study about program	❖ Availability of source code.
❖ Freedom to distribute copies of software	❖ Free distribution
❖ Freedom to modify/improve program and release improvements to public	❖ Integrity of Authors Source Code.

[CBSE Sample Paper II, 12]

13. *Compare Freeware and Shareware.*

Solution. Freeware is a computer software that is available for use at no cost or for an optional fee.
Freeware is generally proprietary software available at zero price and is not free software. The
author usually restricts one or more rights to copy, distribute and make derivative works of the
software.

Shareware is usually offered as a trial version with certain features only available after the license is
purchased, or as a full version, but for a trial period. Once the trial period has passed, the program
may stop running until a license is purchased. Shareware is often offered without support, updates,
or help menus, which only become available with the purchase of a license. The words "free trial" or
"trial version" are indicative of shareware.

[CBSE Sample Paper 2019-20]

14. *Differentiate between open source and open data.*

Solution. The term '**open source**' is applicable to software, which means source code of a software is
freely available and user can make changes in it and reuse it.

The term '**open data**' is applicable to data that is freely available for everyone to use without any
licensing or copyright requirements.

15. *As a citizen of India, what advise you should give to others for e-wate disposal ?*

Or

[CBSE Sample Paper 2019-20]

How should one dispose off the E-waste ?

Solution. E-wastes should not be given to unauthorized vendors/buyers. The respective pollution
control boards in different states, authorize agencies to collect e-waste from generators. The dealers
should have valid consent and authorization. This authorization is given based on the competency
of the recycler, infrastructure and other factors as decided by the regulatory authorities.

16. *According to a survey, one of the major Asian countries generates approximately about 2 million tonnes of
electronic waste per year. Only 1.5 % of the total e-waste gets recycled. Suggest a method to manage e-waste.*

[CBSE Sample Paper 2020-21]

Solution.
- ◈ Buy environment friendly electronics
- ◈ Donate used electronics to social programs
- ◈ Reuse, refurbish electronics
- ◈ Recycling e-waste

17. *What are the freedoms that a free software must provide ?*

    Solution. According to the Free Software Definition free software must fulfill *four* freedoms :

    (*i*)   The freedom to run the program, for any purpose

    (*ii*) The freedom to study how the program works, and adapt it to your needs. Access to the source code is a precondition for this.

    (*iii*) The freedom to redistribute copies.

    (*iv*) The freedom to improve the program, and release your improvements to the public, so that the whole community benefits. Access to the source code is a precondition for this.

18. *Nivedita has recently shifted to new city and new school. She does not know many people in her new city and school. But all of a sudden, someone is posting negative, demeaning comments on her social networking profile, school site's forum etc.*

    She is also getting repeated mails from unknown people. Everytime she goes online, she finds someone chasing her online.

    (*a*) *What is this happening to Nivedita ?*

    (*b*) *What action should she taken to stop them ?*

    Solution.

    (*a*) Nivedita has become a victim of cyber bullying and cyber stalking.

    (*b*) She must immediately bring it into the notice of her parents and school authorities. And she must report this cyber crime to local police with the help of her parents.

19. *Describe following Cyber crimes :   (a) Cyber Bullying   (b) Cyber Stalking*

    Solution. Cyber Bullying refers to act of online harassment of someone by using online tools such as Internet, email, instant messages, chat rooms or social networking sites etc. Cyber trolling, which means posting of sarcastic, demeaning or insulting comments about someone, is also considered form of cyber bullying.

    Cyber Stalking refers to online stalking where someone uses Internet, chat rooms, social networking sites, emails etc. to stalk his/her victim. Cyber stalker follows the victim online everywhere and keeps posting/sending something which are unsolicited.

20. *What can be done to reduce the risk of identity theft ? Write any two ways.*   [CBSE Sample Paper 2019-20]

    Or

    List two measures against online identity theft.

    Solution.

    (*i*) Use unique ids to protect your devices and accounts.

    (*ii*) Using bio-metric protection

21. *Write names of any two common types of Intellectual Property Rights which are protected by the Law.*
    [CBSE D 20C]

    Solution.

    ◈ Rights upon musical, literary, and artistic works

    ◈ Rights upon discoveries and inventions

    ◈ Words, phrases, symbols, and designs

    ◈ Copyrights, trademarks, patents, industrial design rights and trade secrets

GLOSSARY

Digital Footprint	Online activity trail of users on the Internet.
FLOSS	Free Libre (or Livre) Open Source Software. Software that are free as well as open.
Freeware	Software that are available at no cost but cannot be modified.
Free Software	Software available free of cost and also can be copied and redistributed but no source code is available.
OSS (Open Source Software)	Software whose source code is available and which can be modified, copied and redistributed.
Proprietary Software	Software that are neither free nor open.
Shareware	Software for which licence fee is payable after some time limit.
Digital Property	Any information about you or created by you that exists in digital form, either online or on an electronic storage device.
Plagiarism	Stealing someone else's intellectual work and representing it as your own.
Intellectual Property	Creative creations of mind such as patents, literary and creative arts, copyrights, trademarks etc.
Phishing	Attempting to acquire sensitive information from individuals over the internet, by means of deception.
Scam	Any fraudulent business practice that extracts money from an unsuspecting, ignorant person.

Assignment

1. What is digital footprint ?
2. Why is it so important to carefully think of digital footprint ?
3. What is intellectual property ? What do you understand by intellectual property rights ?
4. What is plagiarism ?
5. How can you avoid plagiarism while referring to someone's else's creation ?
6. What is digital property ?
7. What are the threats to digital properties ?
8. How can you protect your digital properties ?
9. Expand the terms : OSI, FLOSS, FSF, GNU, GPL W3C, OSS.
10. What is open source software ? Write the names of any two software which can be categorised as Open Source.   [CBSE D 20C]
11. Compare and Contrast
    (i) Free software and Open source software
    (ii) OSS and FLOSS
    (iii) Proprietary software and Free software
    (iv) Freeware and Shareware
    (v) Freeware and Free software.
12. Consider the following scenario and answer the questions which follow :
    "A student is expected to write a research paper on a topic. The student had a friend who took a similar class five years ago. The student asks his older friend for a copy of his paper and then takes the paper and then submits the entire paper as his own research work".
    (i) Which of the following activities appropriately categorises the act of the writer ?
        (a) Plagiarism   (b) Spamming   (c) Virus   (d) Phishing

(ii) Which kind of offense out of the following is made by the student ?

    (a) Cyber Crime   (b) Civil Crime

    (c) Violation of Intellectual Property Rights   [CBSE D 20C]

13. What is public domain software ? Name some common public domain software licenses.

14. What is GPL software license ? How is it different from LGPL software license ?

15. These days it is equally important to safeguard digital properties :

    (a) What are digital properties ?

    (b) Why is above given statement/fact important ?

    (c) What are possible threats to digital properties ?

    (d) How can digital properties be safeguarded ?

16. Define these terms :

    (i) Phishing   (ii) Scam

    (iii) Hacking   (iv) Spoofing

17. What is cyber crime ? Give examples.

18. Can you give an example of crime which is not cyber crime ?

19. What is Internet addiction ? What are some symptoms of the Internet addiction ?

20. What is cyber bullying ?

21. What is copyright ?

22. What are some types of software licenses ?

23. What are some common net etiquettes ?

Or

What do you understand by Net Etiquettes ? Explain any two such etiquettes.

                                   [CBSE Sample Paper 2020-21]

24. What is hacking ? Who is a hacker ?   [CBSE Sample Paper 2020-21]

25. List any two health hazards related to excessive use of Technology.

26. How does excessive use of technology impact the mental health of a user ?

27. How does excessive use of technology impact the physical health of a user ?

outside attempts to control or gain access, and, depending on your choice of software firewall, it could also provide protection against the most common Trojan programs or e-mail worms.

2. Hardware Firewall

It is physical piece of equipment designed to perform firewall duties. A hardware firewall may actually be another computer or a dedicated piece of equipment which serve as a firewall. Hardware firewalls can be effective with little or no configuration, and they can protect every machine on a local network.

Firewalls keep out malevolent hackers and people who intended to do damage and take over other peoples' servers. Firewalls really serve no other purpose. Firewalls seek to limit the access to a server or computer and let in only the people who need to be there.

NOTE

Confidentiality of information ensures that only authorized users get access to sensitive and protected data.

LET US REVISE

- A **threat** is a potential violation of security. When a threat is actually executed, it becomes **attack**.
- Computer viruses are malicious codes/programs that cause damage to data and files on a system.
- A worm is a self-replicating program, which eats up the entire disk space or memory.
- A trojan horse is a program that appears harmless (such as a text editor or a utility program) but actually performs malicious functions such as deleting or damaging files.
- Spyware is a software which is installed on your computer to spy on your activities and report this data to people willing to pay for it.
- Adware are the programs that deliver unwanted ads to your computer.
- Malware is a general term used to refer to viruses, worms, spyware, adware etc.
- Spamming refers to the sending of bulk-mail by an identified or unidentified source.
- Phishing is the criminally fraudulent process of attempting to acquire sensitive information pertaining to a user.
- To keep a computer protected, one should use updated software, be cautious while handling mails and surfing Internet, scanning computer regularly etc.

Objective Type Questions

OTQs

Multiple Choice Questions

1. A worm is...
   - (a) A slimy pink thing that lives in dirt.
   - (b) Pieces of malicious code that make copies of themselves and spread through computers without human interaction.
   - (c) An unsolicited email message.

2. If you receive an email claiming to need your username and/or password, what should you do ?
   - (a) Report it as phishing/spam through your email provider
   - (b) Delete the message
   - (c) Reply to the message with your email and password

3. What should your response be if you receive an email stating that you have won a lottery or received some inheritance from an unknown person ?

    (a) Send them email asking for further procedure

    (b) Ignore it   (c) Mark it as spam and block it

4. A computer _____ is a malicious code which self-replicates by copying itself to other programs.

    (a) program   (b) virus   (c) application   (d) worm

5. Which of the following is a type of program that either pretends to have, or is described as having, a set of useful or desirable features but actually contains a damaging code.

    (a) Trojans   (b) Viruses   (c) Worm   (d) Adware

6. Which of the following is the type of software that has self-replicating software that causes damage to files and system ?

    (a) Trojans   (b) Viruses   (c) Worm   (d) Adware

7. Which of the following tracks your internet browsing habits and sends you popups containing advertisements related to the sites and topics you've visited ?

    (a) Trojans   (b) Viruses   (c) Worm   (d) Adware

8. What is the broad term covering computer viruses, worms, trojan, adware, etc. ?

    (a) Malware   (b) Spyware   (c) Worm   (d) Adware

9. The attack that focuses on capturing small packets from the network transmitted by other computers and reading the data content in search of any type of information is _____ .

    (a) Phishing   (b) Eavesdropping   (c) Scams   (d) PC intrusion

10. Which of the following is/are source of spreading viruses from one computer to another ?

    (a) Email   (b) Infected data

    (c) Infected programs   (d) All of the above

11. _____ are the attempts by individuals to obtain confidential information from you through an original looking site and URL.

    (a) Phishing scams   (b) Spoofing   (c) Eavesdropping   (d) Pharming

12. _____ is an attempt where a hacker tries to divert network traffic to a bogus site.

    (a) Phishing scams   (b) Spoofing   (c) Eavesdropping   (d) Pharming attack

13. A research student is expected to write a thesis on a topic. The student browses Internet for the topic and luckily finds it on the Internet. He copies and submits the entire thesis as his own research work. Which of the following activities appropriately categorises the act of the writer ?

    (a) Spamming   (b) Phishing   (c) Plagiarism   (d) Trojan   [CBSE D 20C]

Fill in the Blanks

1. _____ is a general term used to refer to viruses, worms, spyware, adware etc.

2. A _____ is a self-replicating program which eats up the entire disk space or memory.

3. _____ is a program that appears harmless (such as a text editor or a utility program) but actually performs malicious functions.

4. _____ is a software which is installed on your computer to spy on your activities and report this data to people willing to pay for it.

5. _____ refers to the sending of bulk-mail by an identified or unidentified source.

6. Unauthorised monitoring of other people's communications is called _____.

7. A _____ is a small piece of data sent from a website and stored in a user's web browser (in a text file) while a user is browsing a website.

8. _____ is a system designed to prevent unauthorized access to or from a private network.

9. A mail or message sent to a large number of people indiscriminately without their consent is called
_____ . [CBSE Sample Paper 2020-21]

10. Receiving irrelevant and unwanted emails repeatedly is an example of _____.
[CBSE Sample Paper 2020-21]

True/False Questions

1. Computer viruses are healthy codes/programs written to test the security health of a system.

2. A worm is a self-replicating program.

3. A trojan horse is a utility program that does harm when its date gets expired.

4. Spyware is healthy software which keeps an eye of activities happening on your computer.

5. Adware are the programs that deliver unwanted ads to your computer.

6. Malware is a special type of virus.

7. Spamming refers to the sending of bulk-mail by an identified or unidentified source.

8. Phishing involves authentic looking sites trying to collect your sensitive transactional and identity information.

9. To keep a computer protected, one should use updated software, be cautious while handling mails and surfing Internet, scanning computer regularly etc.

10. Firewall can be implemented in software as well as in hardware.

NOTE : Answers for OTQs are given at the end of the book.

Solved Problems

1. *Describe why authentication is important for file protection.*

   Solution. Authentication is the process of determining whether someone is a legal user. It is the process of identifying an individual, usually based on a username and password. Authentication merely ensures that the individual is who he or she claims to be, but says nothing about the access rights of the individual. It is used a primary step for file protection from unauthorised users.

2. *Viruses, pharming and phishing are all examples of potential Internet security issues. Explain what is meant by each of these three terms.*

   Solution. **Virus** refers to a computer program/software that replicates/copies itself. It can delete or alter files/data stored on a computer and can even make the computer "crash"/run slow.

   Pharming is a way to trick unsuspecting user by inserting malicious code/software installed on a user's hard drive/actual web server. This code redirects user to a fake website (without his/her knowledge). Pharming takes place generally to obtain personal/financial information/data.

   Phishing is another way to trick unsuspecting user where legitimate-looking emails are sent to a user. As soon as recipient opens/clicks on link in the email/attachment, the user is directed to a fake website (without his/her knowledge). Like *Pharming*, *Phishing* also takes place generally to obtain personal/financial information/data.

3. *What is anti-virus software ?*

   Solution. There are a number of malicious software ('malware') programs that can cause damage to computers. These include viruses, worms, Trojan horses (Trojans), malware, spyware etc.

   Anti-virus software is designed to detect and block attacks from malware. This software when loaded, resides in memory and checks every operation if it is malicious or not. If it finds any suspicious activity, it blocks that operation and saves our computer.

4. *Internet security is a major issue for many people. The following is a list of five typical security issues:*

   ▲ *pharming*

   ▲ *phishing*

   ▲ *spyware*

   ▲ *viruses*

   For each one, describe the security issue and suggest a way of protecting against it.

   Solution.

Security Issue	Description of Security Issue	Method of Protection
Pharming	It is actually a code installed on the hard drive of a user's computer or on actual web server ; code redirects user to a bogus/fake website without user knowing.	❖ Use filters to authenticate websites. ❖ User should be alert and look for pharming clues which indicate being directed to a bogus site.
Phishing	In phishing, creator sends legitimate-looking (fake) email in the hope of gaining personal/ financial information ; fake email replicates a well known company *e.g.*, a bank.	❖ ISPs can filter/block out phishing emails. ❖ User should be aware of opening links in emails.
Spyware	It is a type of software that gathers information by monitoring key presses on a user's keyboard or activity and relays the information back to person who sent the spyware.	❖ Use dropdown boxes. ❖ User should be alert and look for clues when using their computer.
Viruses	It refers to program or coding that replicates itself / corrupts the system/alters or deletes data.	❖ Use anti-virus software. ❖ Do not use disks/software from unknown sources. ❖ Do not open emails from unknown senders.

5. *What is the need for secure passwords ?*

   Solution. When more than one person uses a network, it is important to have user IDs and passwords. Only someone with a valid login and password can access that network. It also helps the network manager trace unusual activity to a specific user.

   A weak password makes it easy for someone to try to guess your login details. A good password will have a mix of upper case and lower case letters, numbers and special characters. A good combination of these makes a strong password and difficult to crack it. Hence a strong password keeps our system secure.

6. *What measures should you take to keep data secure ?*

   Solution. Measures that can be taken to keep data secure include :

   (i) Making regular backups of files (backup copies should be stored in fireproof safes or in another building).

   (ii) Protecting against viruses by running anti-virus software.

   (iii) Using a system of strong passwords so that access to data is restricted.

   (iv) Safe storage of important files stored on removable disks, *e.g.*, locked away in a safe location.

7. *I can keep you signed in.*

    I can remember your site preferences.

    I can give you locally relevant content.

    Who am I ?

    Solution. Cookies.

GLOSSARY

Phishing	Tricking users to give login ids and password by authentic looking site addresses.
Virus	A malicious code written to harm the data and applications.
Worm	Self replicating program that eats up all the memory/space.

Assignments

1. What is a virus ? What is anti-virus software ?
2. How is backup utility useful ? Is it necessary to take backup of data ?
3. What is a computer virus ? How can it affect your computer ?
4. What are different type of threats to computer security ?
5. What type damages can be caused by viruses to your computer ?
6. What are Malware ? What type of damages can they cause to your computer ?
7. What is a Spam ? Why has it become a big Internet issue ?
8. What do you understand by PC intrusion ?
9. What measure would you take to avoid :
    (*i*) Virus attack   (*ii*) Spyware   (*iii*) Adware   (*iv*) Spam   (*v*) PC intrusion ?
10. What are denial-of-service and Sweeper attacks ?
11. What is phishing ?
12. How is pharming similar to and different from phishing ?
13. What is (*i*) Authentication, (*ii*) Authorization ? Why are these two used together ?
14. What is the significance of a firewall in a computer's security scheme ?
15. What is Eavesdropping ? What security measures can you take up to prevent it ?

Unit IV : Societal Impacts

NCERT Chapter 6 : Societal Impacts

1. *After practicals, Atharv left the computer laboratory but forgot to sign off from his email account. Later, his classmate Revaan started using the same computer. He is now logged in as Atharv. He sends inflammatory email messages to few of his classmates using Atharv's email account. Revaan's activity is an example of which of the following cyber crime ?*

   Justify your answer.

   (a) Hacking   (b) Identity theft

   (c) Cyber bullying   (d) Plagiarism

   Ans. (b) Identity Theft

   Identity theft means obtaining someone's credentials to commit some online fraud.

2. *Rishika found a crumpled paper under her desk.She picked it up and opened it. It contained some text which was struck off thrice. But she could still figure out easily that the struck off text was the email ID and password of Garvit, her classmate. What is ethically correct for Rishika to do ?*

   (a) *Inform Garvit so that he may change his password.*

   (b) *Give the password of Garvit's email ID to all other classmates.*

   (c) *Use Garvit's password to access his account.*

   Ans. (a) Inform Garvit so that he may change his password.

3. *Suhana is down with fever. So, she decided not to go to school tomorrow. Next day, in the evening she called up her classmate, Shaurya and enquired about the computer class. She also requested him to explain the concept. Shaurya said, "Mam taught u show to use tuples in python". Further, he generously said, "Give me some time, I will email you the material which will help you to understand tuples in python". Shaurya quickly downloaded a 2-minute clip from the Internet explaining the concept of tuples in python.*

   Using video editor, he added the text "Prepared by Shaurya" in the downloaded video clip. Then, he emailed the modified video clip to Suhana. This act of Shaurya is an example of :

   (a) Fair use   (b) Hacking

   (c) Copyright infringement   (d) Cyber crime

   Ans. (c) Copyright infringement

4. *After a fight with your friend, you did the following activities. Which of these activities is not an example of cyber bullying ?*

   (a) *You sent an email to your friend with a message saying that "I am sorry".*

   (b) *You sent a threatening message to your friend saying "Do not try to call or talk to me".*

   (c) *You created an embarrassing picture of your friend and uploaded on your account on a social networking site.*

   Ans. (a) You sent an email to your friend with a message saying that "I am sorry".

5. Sourabh has to prepare a project on "Digital India Initiatives". He decides to get information from the Internet. He downloads three web pages (webpage 1, webpage 2, webpage 3) containing information on Digital India Initiatives. Which of the following steps taken by Sourabh is an example of plagiarism or copyright infringement? Give justification in support of your answer.

   (a) He read a paragraph on "Digital India Initiatives" from webpage 1 and rephrased it in his own words. He finally pasted the rephrased paragraph in his project.

   (b) He downloaded three images of "Digital India Initiatives" from webpage 2. He made a collage for his project using these images.

   (c) He downloaded "Digital India Initiative" icon from web page 3 and pasted it on the front page of his project report.

Ans. (b) and (c)

Plagiarism means using someone else's work without giving adequate citation for use and presenting as your own work.

Copyright infringement means using copyright-protected material without obtaining copyright-holder's permission or without paying for it, if it is being sold

6. Match the following :

Column A		Column B	
(a)	Plagiarism	1.	Fakers, by offering special rewards or money prize asked for personal information, such as bank account information.
(b)	Hacking	2.	Copy and paste information from the Internet into your report and then organise it.
(c)	Credit card fraud	3.	The trail that is created when a person uses the Internet.
(d)	Digital Foot Print	4.	Breaking into computers to read private emails and other files.

Ans. (a) → 2 ; (b) → 4 ; (c) → 1   (d) → 3

7. You got the below shown SMS from your bank querying a recent transaction. Answer the following :

   (a) Will you SMS your pin number to the given contact number ?

   (b) Will you call the bank help line number to recheck the validity of the SMS received ?

Ans. (b)

8. Preeti celebrated her birthday with her family. She was excited to share the moments with her friend Himanshu. She uploaded selected images of her birthday party on a social networking site so that Himanshu can see them. After few days, Preeti had a fight with Himanshu. Next morning, she deleted her birthday photographs from that social networking site, so that Himanshu cannot access them. Later in the evening, to her surprise, she saw that oneof the images which she had already deleted from the social networking site was available with their common friend Gayatri. She hurriedly enquired Gayatri "Where did you get this picture from?". Gayatri replied "Himanshu forwarded this image few minutes back".

Help Preeti to get answers for the following questions.Give justification for your answers so that Preeti can understand it clearly.

   (a) How could Himanshu access an image which I had already deleted ?

   (b) Can anybody else also access these deleted images ?

   (c) Had these images not been deleted from my digital footprint ?

Ans.

(a) Images loaded on a social networking site can be saved/downloaded or even screenshots may be taken.

(b) Yes, from the digital footprint, government and other agencies can obtain these legally, if needed.

(c) Images deleted from a social website always remain part of a digital footprint.

9. *The school offers wireless facility (wifi) to the Computer Science students of Class XI. For communication, the network security staff of the school have a registered URL schoolwifi.edu. On 17 September 2017, the following email was mass distributed to all the Computer Science students of Class XI. The email claimed that the password of the students was about to expire. Instructions were given to go to URL to renew their password within 24 hours.*

> **Your Password will Expire in 1 Day!**   — ⌃ ✕
>
> Dear Students,
>
> This mail is meant to inform you that your School/WiFi network password will expire in 24 hours. Please follow the link below to update your password.
>
> Schoolwifii.edu/updatepassword
>
> Thank you
>
> Network Security Staff

(a) *Do you find any discrepancy in this email ?*

(b) *What will happen if the student will click on the given URL?*

(c) *Is the email an example of cyber crime ? If yes, then specify which type of cyber crime is it. Justify your answer.*

Ans.

(a) Yes, there is an extra 'i' in the URL of the email.

(b) It is a phishing site which will steal the students' data.

(c) It is an example of phishing where using a similar looking URL and site , people are fooled.

10. *You are planning to go for a vacation. You surfed the Internet to get answers for the following queries :*

(a) Weather conditions

(b) Availability of air tickets and fares

(c) Places to visit

(d) Best hotel deals

Which of your above mentioned actions might have created a digital footprint ?

Ans. All of these

11. *How would you recognise if one of your friends is being cyber bullied ?*

(a) *Cite the online activities which would help you detect that your friend is being cyber bullied ?*

(b) *What provisions are in IT Act 2000, (amended in 2008) to combat such situations.*

Ans.

(a) Repeated posting of rumours, giving threats online, posting the victim's personal information, sexual harassment or comments aimed to publicly ridicule a victim.

(b) The act provides legal framework for electronic governance by giving recognition to electronic records and digital signatures. The act outlines cyber crimes and penalties for them.

12. *Write the differences between the following :*

    (a) *Copyright and Patent*

    (b) *Plagiarism and Copyright infringement*

    (c) *Non-ethical hacking and Ethical hacking*

    (d) *Active and Passive footprints*

    (e) *Free software and Free and open source software*

Ans.

    (a) **Copyright.** A copyright is a collection of rights automatically vested to someone who has created an original work. The copyright owner has the authority to keep or to transfer the rights to use/distribute, individually to one or more people, or to transfer them collectively to one or more people.

        Patent. A patent is a grant of exclusive right to the inventor by the government. Patents give the holder a right to exclude others from making, selling, using or importing a particular product or service, in exchange for full public disclosure of their invention.

    (b) **Plagiarism.** Plagiarism is stealing someone else's intellectual work and representing it as your own work without citing the source of information.

        Copyright infringement. Copyright infringement is the use or production of copyright-protected material without the permission of the copyright holder.

    (c) **Ethical Hacking** is done on behalf of a company, which wants to find out the loopholes in the system in context to security. **Unethical Hacking**, on the other hand, is done in order to harm or cause loss to an individual or a company.

    (d) An active digital footprint includes data that you intentionally submit online, *e.g.*, sending an email, sending messages online, posting a social media post, replying to post or commenting online etc.

        A passive digital footprint gets created through your data trail that you unintentionally leave online. For example, when you visit a website, the web server may log your IP address, which identifies your Internet service provider and your approximate location.

    (e) Refer to Solved Problem 12, Chapter 11.

        An open source software which is available free of cost is *free and open source software*.

13. *If you plan to use a short text from an article on the web, what steps must you take in order to credit the sources used ?*

    Ans.

      (i) Determine if you need the permission to use the desired piece of work.

     (ii) Identify the owner of the article.

    (iii) Identify the rights needed to use it.

    (iv) Contact the owner and negotiate whether payment is required.

     (v) Get your permission agreement in writing.

14. *When you search online for pictures, how will you find pictures that are available in the free public domain. How can those pictures be used in your project without copyright violations ?*

    Ans. The images with Copyleft or Creative Commons licences can be used without copyright violations. Hence we can search for images with such licenses.

15. *Describe why it is important to secure your wireless router at home. Search the Internet to find the rules to create a reasonably secure password. Create an imaginary password for your home router. Will you share your password for home router with following people ? Justify your answer.*

   (*a*) Parents   (*b*) Friends   (*c*) Neighbours   (*d*) Home tutors

   Ans. WiFi router security is important otherwise any one can use our wifi to commit fraud or cybercrimes. We shall share the password with parents only.

16. *List down the steps you need to take in order to ensure —*

   (*a*) *your computer is in good working condition for a longer time.*

   (*b*) *smart and safe Internet surfing.*

   Ans.

   (*a*) ◈ Keep your computer hardware dust free.

        ◈ Keep your computer software clean (junk free).

   (*b*) (*i*) Download only from secure websites and official app stores.

   (*ii*) Always type the URLs rather than using a webpage or email link.

   (*iii*) Avoid clicking on unknown links.

   (*iv*) Use regularly updated anti-virus software.

   (*v*) Look for secure URLs (with https) while providing data or making payments.

   (*vi*) Avoid using the proxy sites and proxy software.

17. *What is data privacy ? Websites that you visit collect what type of information about you ?*

   Ans. Data privacy refers to the rules about the authorised access of data, *i.e.,* which all users/sites/ service providers etc. can access or track the data/ browsing information.

   Websites collect the information such as :

   – IP addresses of the user's computer (user's location).

   – Information about usage of website. For example, what users click on and how long they spend on a page.

   – Information about browsers and device used to access the sites.

   – Browsing activity across different sites.

18. *In the computer science class, Sunil and Jagdish were assigned the following task by their teacher :*

   (*a*) Sunil was asked to find information about "India, a Nuclear power". He was asked to use Google Chrome browser and prepare his report using Google Docs.

   (*b*) Jagdish was asked to find information about "Digital India". He was asked to use Maxilla Firefox browser and prepare his report using Libre OfficeWriter.

   What is the difference between technologies used by Sunil and Jagdish ?

   Ans. Sunil used freeware while Jagdish used free and open source software.

19. *Cite examples depicting that you were a victim off allowing cyber crime. Also, cite provisions in IT Act to deal with such a cyber crime :*

   (*a*) Identity theft   (*b*) Credit card account theft

   Ans. (*a*) Someone got hold of login and password of our social network site and used it to troll or cyber bully someone using stolen credentials.

   (*b*) Someone did fraud shopping after stealing our credit card.

20. Neerja is a student of Class XI. She has opted for Computer Science. Neerja prepared the project assigned to her. She mailed it to her teacher. The snapshot of that email is shown below.
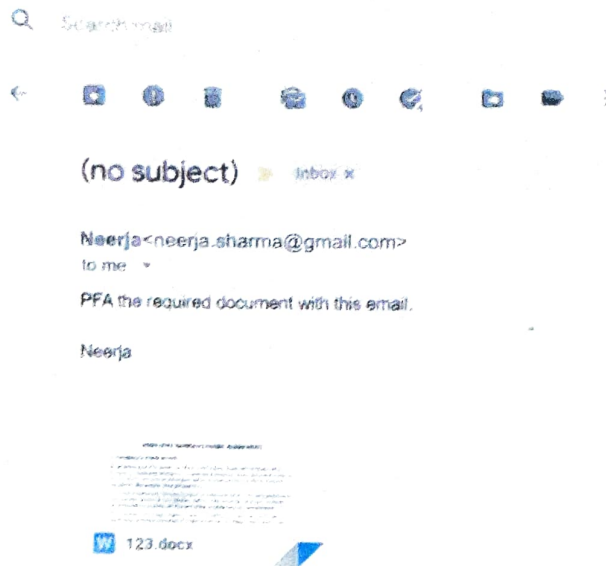
Find out which of the following email etiquettes are missing in it. Justify your answer.

(a) Subject of the mail

(b) Formal greeting

(c) Self-explanatory terms

(d) Identity of the sender

(e) Regards

Ans. (a), (c), (d)

The shown email lacks a valid subject, a formal addressing and greeting to the receiver and Regards.

21. Sumit got good marks in all the subjects. His father gifted him a laptop. He would like to make Sumit aware of health hazards associated with inappropriate and excessive use of laptop. Help his father to list the points which he should discuss with Sumit.

Ans. Excessive digital usage may lead to :

◈ Impact on bones and joints

◈ Eye strain

◈ Sleep issues

◈ Mental health issues

◈ Internet addiction disorder