

# Cyber Security in Nutshell

TYPE B

## SHORT ANSWER QUESTIONS

[2, 3 Marks]

100. What measures can you take to curb online frauds ?

**Ans.** You can protect yourself against identity theft by following the steps given below :

- (i) Protect personal information with unique ids and strong passwords.
- (ii) Use Unique Ids to protect our devices and accounts.
- (iii) Use Bio-metric protection.

101. What is digital property ? What are the threats to digital properties ?

**Ans.** Digital property (or digital asset) 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.**

Common threats to digital properties are :

1. **Digital software penetration tools** such as *cracks* and *keygens*, tools created by hackers.
2. **Stealing and plagiarizing codes of your digital properties.**

102. How can you protect your digital properties ?

**Ans.** The protective measures for digital properties are :

1. **Anti-Temper Solutions** such as *utility tools, software, apps, video games* and so forth.
2. **Legal Clauses.** Add legal clause in the clauses of use of your software/digital properties.
3. **Limit the sharing of software code.**

103. What is secure data transmission ? What technical ways are used to ensure the secure data transmission ?

**Ans.** Secure data transmission means applying enough technical safeguards so that data travels safely to its target, without being compromised or eavesdropped.

To ensure secure data transmission, majorly following techniques are applied :

- (i) **SSL secure data transmission.** SSL (*Secure Sockets Layer*) is a standard security protocol which ensures data security by establishing encrypted online links between a web server and a browser.
- (ii) **Data encryption.** Encrypted data when sent over Internet is hard to steal and hence is safer.
- (iii) **Using Safe protocols** such as for files, secure FTP protocol.

104. Why should intellectual property rights be protected ?

**Ans.** 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.



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

**Ans.** 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.

106. What is digital property ? Give some examples of digital properties.

**Ans.** 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.**

107. Describe the terms freeware and open source software. Write examples of one Proprietary and one OSS Software.

**Ans.** Freeware 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 other hand, 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.

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

**Ans.**

(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.

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

**Ans.** 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.



110. 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.

**Ans.** 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 solid support-base in the 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.

111. Posing as someone else online and using his/her personal/financial information shopping online or posting something is a common type of cyber crime these days.

(a) What are such types of cyber crimes collectively called ?

(b) What measures can you take to stop these ?

**Ans.** (a) Online fraud

(b) The measures to stop these frauds may include :

- A monitoring official body that ensures the sanctity of Ecommerce Company and delivery of goods/services as promised.
- Strong security mechanism by the ecommerce site and payment gateways to prevent stealing of crucial information.

Official guidelines and safeguards on the selling of users' data to third parties.

112. What are common gender and disability issues faced while teaching/using computers in classrooms ?

**Ans.** The Gender issues while teaching /using computers are : under representation of girls, not girl-friendly work-culture, etc.

Disability issues while teaching/using computers are : unavailability of teaching materials/aids, lack of special needs teachers and lack of supporting curriculum, etc.

113. Give examples of software, hardware that may be used for special needs students.

**Ans.**

1. Sophisticated virtual keyboard software.
2. A joystick that is specific to the needs of the child.
3. A programming editor that can be interfaced with the virtual keyboard, and does not require any mouse movements.
4. For low-vision students, Braille keyboards, monitors, and printers should be made available to facilitate their learning and working on computers.



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

Ans.

Free Software	Open Source Software
<ul style="list-style-type: none"> <li><input type="checkbox"/> Freedom to run program for any purpose</li> <li><input type="checkbox"/> Freedom to study about program</li> <li><input type="checkbox"/> Freedom to distribute copies of software</li> <li><input type="checkbox"/> Freedom to modify/improve program and release improvements to public</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> It has distribution of license.</li> <li><input type="checkbox"/> Availability of source code.</li> <li><input type="checkbox"/> Free distribution</li> <li><input type="checkbox"/> Integrity of Authors Source Code.</li> </ul>

115. What is the difference between Proprietary software and Open source software ?

Ans.

	Proprietary	Open Source
Cost	Mostly available for a free	Must be free to use modify and redistribute.
Support	Support provided by the vendor at a cost.	Community of users and developers
Ownership of Source Code	Organization that created it	Free, no ownership
Modification of Source Code	Only organization/creator can modify	Free, anyone can modify
Copyright	Licensed, typically for a free	Licensed ; typically for a free
Code	Provide only Object code not source code	Provide source code with object code

116. What is the difference between Free software and Freeware ?

Ans.

	Free Software	Freeware
About	Free software is <b>software</b> that can be used, studied, and modified without restriction, and which can be copied and redistributed in modified or unmodified form either without restriction.	Freeware refers to software that anyone can download from the Internet and use for free.
License and Copyright	<b>GNU General Public License</b> or similar open source licenses. A copyright is usually put just on the name of the software and the freedoms to use are also listed.	User license or EULA (End User License Agreement) is an important part of freeware. Each license is specific to the freeware. <b>Copyright</b> laws are also applicable to Freeware.
Features	All the features are free.	All the features are free.
Distribution	Programs can be distributed free of cost.	Freeware programs can be distributed free of cost.
Example	<b>Mozilla Firefox</b> , gedit, vim, pidgin, GNU Coreutils, Linux kernel	Adobe PDF, Google Talk, yahoo messenger, MSN messenger



117. What is the difference among Freeware, Free software and Open source software ?

**Ans.** Freeware is a software available at no fee but its source code or any freedom to use/modify is not available. "Free software" and "Open source software" are two terms for the same thing : software released under licenses that guarantee a certain, specific set of freedoms.

According to Bruce Perens, one of the founders of the OSI and Open Source Definition, **the Open Source term was intended as a synonym for Free Software.**

Freeware comes with a terms to use while free/open source software give freedom to use/modify the code.

All open source software can be used for commercial purpose.

118. What is the difference among Shareware, Freeware and Public domain software ?

**Ans. Shareware.** Shareware software is distributed at low (or sometimes no) cost, but usually requires payment and registration for full legal use. Copies are distributed on a trial basis. You are free to test the software, see if it matches your needs, and decide whether it's a good value.

**Freeware.** Freeware is also distributed at minimal cost, but in this case the authors do not expect payment for their work. Typically, freeware programs are small utilities or incomplete programs that authors release for their potential benefit to others, but without support. The author of a freeware program may still retain a copyright on its contents and stipulate that others not modify the program or charge significant fees for its use or distribution.

**Public domain software.** Public domain software is not copyrighted. It is released without any conditions upon its use, and may be used without restriction. This type of software generally has the lowest level of support available.

119. Are public domain software open source software ? How are these two similar or different ?

**Ans.** "Open Source" describes a subset of free software that is made available under a copyright license along with its Source code openly available. Open source software gives people permission in advance to use the software as per their own needs and innovate or change it with technology.

"Public Domain" means software (or indeed anything else that could be copyrighted) that is not restricted by copyright. It may be this way because the copyright has expired, or because the person entitled to control the copyright has disclaimed that right.

A public domain software may not be necessarily an open source software.

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

**Ans.** According to the Free Software Definition free software must fulfill 4 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.



121. Compare freeware and Shareware.

[CBSE Sample Paper II, 12]

**Ans.** Freeware is 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.

122. What do you mean by Spam mails ? How can you protect your mailbox from Spams ?

[CBSE Sample Paper I, 12]

**Ans.** Spam mails, also known as junk e-mail, is a subset of spam that involves nearly identical messages sent to numerous recipients by e-mail. We can protect our mailbox from spams by creating appropriate filters.

123. What is free software ? How is it different from Open Source Software ?

**Ans.** Free software means the software is freely accessible and can be freely used, changed and distributed by all who wish to do so. And no payments are needed to be made for free software.

Open Source Software is different from free software in the sense that it does not have to be free of charge (contrary to free software).

124. Differentiate between open source and open data.

[CBSE Sample Paper 2019-20]

**Ans.** 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.

125. Compare and Contrast

- (i) OSS and FLOSS
- (ii) Proprietary software and Free software
- (iii) Freeware and Shareware
- (iv) Freeware and Free software.

**Ans.**

- (i) **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*.



- (ii) **Proprietary software** is the software that is *neither open nor freely available*. Its use is regulated and further distribution and modification is either forbidden or requires special permission by the supplier or vendor. Source code of proprietary software is normally not available.

**Free Software** means the software is freely accessible and can be freely used, changed, improved, copied and distributed by all who wish to do so. And no payments are needed to be made for **free software**.

- (iii) The term **freeware** has no clear definition, but is generally used for software, which is available free of cost and which allows copying and further distribution, but **not modification** and whose source code is not available. Freeware should not be mistaken for *open software* or for *free software*.

**Shareware** is software, which is made available with the right to redistribute copies, but it is stipulated that if one intends to use the software, 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.

- (iv) The term **freeware** has no clear definition, but is generally used for software, which is available free of cost and which allows copying and further distribution, but **not modification** and whose source code is not available. Freeware should not be mistaken for *open software* or for *free software*.

**Free Software** means the software is freely accessible and can be freely used, changed, improved, copied and distributed by all who wish to do so. And no payments are needed to be made for **free software**.

**126. Discuss some commonly available public domain/open source software licenses.**

**Ans. 1. The MIT License.** The MIT license is a free software license created by the MIT (Massachusetts Institute of Technology). It puts very limited restrictions on reuse.

Its Key points are :

- You can use, copy and modify the software however you want. No one can prevent you from using it on any project, from copying it however many times you want and in whatever format you like, or from changing it however you want.
- You can give the software away for free or sell it. You have no restrictions on how to distribute it.
- The only restriction is that it be accompanied by the license agreement. It basically says that anyone can do whatever they want with the licensed material, as long as it's accompanied by the license.

**2. The BSD License.** The BSD license is a part of a family of permissive free software licenses, imposing minimal restrictions on the use and redistribution of covered software.

It Key points are :

- (i) Keeps the copyright notice.
- (ii) You are free to use, redistribute, and license the code under another license.

**3. The Apache 2.0 License.** The Apache 2.0 license is a permissive free software license by the Apache Software Foundation.



These rights can be applied to both *copyrights* and *patents*. The Apache License offers :

- (i) Keeps the copyright notice and a copy of the Apache 2.0 license.
- (ii) You are free to use, modify, distribute, and redistribute the software.
- (iii) If you modify the code, you have to mention your modifications particularly.
- (iv) Rights are granted for no fee or royalty.
- (v) Rights are worldwide and irrevocable.

**4. The GPL (GNU General Public License).** The GPL license is the first *copyleft license* for general use. A *copyleft license* means the derivative work can only be distributed under the same license terms.

Its key points are :

- (i) Keeps the licensing header.
- (ii) Your software release has to be GPL-licensed too.
- (iii) If anyone requests it, you have to make the sources available.

**5. The LGPL (GNU LesserGeneral Public License).** The LGPL license is a weak copyleft license for general use.

The LGPL and GPL licenses differ with one major exception ; with LGPL the requirement that you have to release software extensions in open GPL has been removed.

Mostly, LGPL is used by libraries.

Its key points are :

- (i) Keeps the licensing header.
- (ii) If anyone requests it, you have to make the sources available.

**127. Explain Phishing and how to prevent it?**

**Ans.** Phishing is the practice of attempting to acquire sensitive information from individuals over the internet, by means of deception. Information typically targeted by phishing schemes includes passwords, user-names, bank account information, and social security numbers.

One can prevent the phishing attacks by using the following practices :

- Don't enter sensitive information in the webpages that you don't trust
- Verify the site's security
- Use Firewalls
- Use AntiVirus Software that has Internet Security
- Use Anti-Phishing Toolbar

**128. Why should E-waste be handled properly ? Is it toxic ?**

**Ans.** Some of the components of e-waste contain materials such as lead, cadmium, mercury, polychlorinated biphenyls (PCBs), etched chemicals, brominated flame retardants which are hazardous in nature. Therefore, e-waste should be handled in an environment-friendly manner to prevent this hazardous material polluting the environment.

E-waste as such is not toxic. However, processing of e-waste to recover valuable materials such as lead, copper and gold is hazardous. Therefore, a careful environmentally sound recovery process is required for recycling the e-waste.