

Final Examination for the Course Opensource Software Paradigms

Maximum score: 50%

Time Allowed: 2hrs

Item	True/ False	MSQ	Short Answer	Scenario based	Total
Value	5%	25%	12%	8%	50%

Part I: True or False Items

Instruction: Indicate whether each of the following statements is true or false. Circle "True" if the statement is correct, or "False" if the statement is incorrect. *(total 5pts – 1pt each)*

1. All open source projects must strictly adhere to the principles of the GNU General Public License (GPL), which is the only valid open source license.
2. Term 'Free Software' is also known as Free/Liberal Open Source Software (FLOSS) or FOSS.
3. The Creative Commons licenses, while primarily used for creative works, can also be applied to some types of software, such as documentation or artistic elements within software.
4. The GPLv2 is considered more restrictive than the GPLv3, as it does not include the patent clause.
5. The AGPL (Affero General Public License) only applies to software that is distributed over a network.

Part II: Multiple Choice Items

Instruction: For each of the following questions, select the one answer choice that best completes the statement or answers the question. Circle the letter of your chosen answer. *(total 25pts – 1pt each)*

1. What is the main principle behind free software?
 - A. Software must be free of charge
 - B. Software must grant users freedom to run, modify, and share
 - C. Software must be developed by a single company
 - D. Software must have no licensing
2. Open source development is often compared to which model?
 - A. Cathedral model
 - B. Castle model
 - C. Bazaar model
 - D. Factory model
3. Which organization is responsible for maintaining the Open Source Definition and approving open-source licenses?
 - A. Free Software Foundation (FSF)
 - B. Open Source Initiative (OSI)

- C. Software Freedom Law Center (SFLC)
 - D. Linux Foundation
4. A software company aims to promote its software product by offering full functionality for a limited time, allowing users to download and use it for free. This approach helps users experience the product's usability. The software package is_____.
- A. Freeware
 - B. Open Source Software
 - C. Shareware
 - D. Proprietary Software
5. What does copyleft mean in the context of open-source licenses?
- A. The software cannot be copied or modified.
 - B. The software can be freely copied but not modified.
 - C. The requirement that any derivative works must be released under the same license terms.
 - D. The requirement that all derivative works include a copyright notice and a disclaimer of warranty.
6. _____ is a practice where an open source project is also made available under a proprietary license.
- A. FOSS
 - B. Freemium
 - C. Dual licensing
 - D. Public domain
7. Which derivative of the BSD variant focused on portability?
- A. FreeBSD
 - B. OpenBSD
 - C. NetBSD
 - D. DragonFly BSD
8. _____ is an open-source operating system designed to be binary-compatible with Windows, allowing users to run Windows applications without a Windows OS?
- A. Linux
 - B. FreeBSD
 - C. Chromium OS
 - D. ReactOS
9. Which of the following is not an open-source web server? (CLO 3)
- A. Apache HTTP Server
 - B. Nginx
 - C. Internet Information Services (IIS)
 - D. Lighttpd
10. Which of the following describes a unified analytics engine for large-scale data processing, known for its speed and ease of use, that supports in-memory processing and can run on Hadoop?
- A. Apache Spark
 - B. Apache Flink
 - C. Apache Storm
 - D. Hadoop MapReduce
11. The Linux kernel is released under which license?
- A. GPLv3
 - B. GPL v2
 - C. MPL
 - D. BSD

12. You are developing a mobile app and want to use a mapping library that is licensed under the AGPL. What is the legal requirement regarding the source code of your app?
- A. You can use the library without any restrictions.
 - B. You must make the source code of your entire app available if you distribute it.
 - C. You only need to make the mapping library's source code available.
 - D. You can use the library privately without sharing any code.
13. Which license is designed specifically to ensure that software remains free for all users, requiring any modified versions to also be open-sourced?
- A. MIT License
 - B. Apache License
 - C. GPL
 - D. BSD License
14. Which of the following licenses includes a clause that explicitly addresses software patents?
- A. MIT License
 - B. GPLv2
 - C. Apache License 2.0
 - D. BSD License
15. Which license allows software to be used, modified, and distributed without requiring the source code to be released?
- A. GPL
 - B. BSD License
 - C. AGPL
 - D. MPL
16. You are developing a video game and want to include a popular open-source physics engine that is licensed under the LGPL. Which of the following statements is true regarding the use of this physics engine in your game?
- A. You must release the source code of your game because you are using the LGPL-licensed engine.
 - B. You can use the physics engine without releasing the source code of your game, as long as you comply with LGPL terms.
 - C. You can use the engine only if you pay a licensing fee.
 - D. You cannot use the LGPL-licensed engine in a commercial game.
17. What is the primary purpose of a patent?
- A. To protect original creative works, such as software code.
 - B. To grant exclusive rights to an invention or a new process for a limited time.
 - C. To ensure that software is freely available to the public.
 - D. To prevent the unauthorized copying of software
18. Which of the following statements about open-source licenses is true?
- A. The MIT License requires users to disclose their source code when distributing derivative works.
 - B. The GPL (General Public License) allows proprietary modifications without releasing the source code.
 - C. The Apache License 2.0 allows for both open-source and closed-source use, with attribution requirements.
 - D. The BSD License prohibits the use of the software in commercial applications.

19. What does it mean to "stage" changes in Git?
- A. To permanently save changes to the repository.
 - B. To temporarily save changes that you don't want to commit yet.
 - C. To prepare changes to be included in the next commit.
 - D. To revert to a previous version of your code.
20. Which command is used to fetch and merge changes from the remote repository?
- A. git pull
 - B. git push
 - C. git clone
 - D. git add
21. What does the HEAD pointer in Git represent?
- A. The first commit in the repository.
 - B. The latest commit in the remote repository.
 - C. The currently checked-out commit.
 - D. The base of the current branch.
22. What is the difference between git fetch and git pull?
- A. git fetch only downloads new data from the remote repository, while git pull downloads and merges the changes.
 - B. git fetch merges changes from the remote repository, while git pull only downloads new data.
 - C. git fetch is used to create a new branch, while git pull is used to merge branches.
 - D. There is no difference between git fetch and git pull.
23. What is the primary purpose of a Contributor License Agreement (CLA)?
- A. To restrict contributions to only certain individuals.
 - B. To clarify the rights and responsibilities of contributors and maintainers.
 - C. To require contributors to pay a fee for their contributions.
 - D. To automatically grant ownership of contributions to a third party.
24. A project uses a Contributor License Agreement that states all contributions are licensed under the MIT License. What does this imply for contributors?
- A. Contributors retain all rights to their code.
 - B. Contributors can only use their code in non-commercial projects.
 - C. Contributors agree to license their contributions under the MIT License, allowing others to use, modify, and distribute their code.
 - D. Contributors must submit all future contributions under the GPL.
25. You are contributing code to an open-source project that requires you to sign a Contributor License Agreement (CLA). What are the implications of signing this CLA for your contributions?
- A. You lose all rights to your code after submission.
 - B. You can still use your code in other projects, but the maintainers can also use it freely.
 - C. You must seek permission from the maintainers for any future use of your code.
 - D. The project will automatically take ownership of your code.



Part III: Short Answer Items (total 12pts)

Instruction: Provide a short answer to each of the following questions. Write your answers in the space provided.

1. What is the significance of the “no warranty” clause commonly found in opensource license? **(2pts)**
2. Briefly explain the difference between a Contributor License Agreement (CLA), Copyright Assignment Agreement (CAA) and a Developer Certificate of Origin (DCO). **(4pts)**
3. Why is the Open Document Format (ODF) considered a critical feature of open-source office suites like LibreOffice? **(2pt)**
4. According to the "Cathedral vs. Bazaar" model, what is one key characteristic of the "Bazaar" development style? **(2pts)**
5. The primary goal of a Copyleft license is to ensure that the software, and all its modified versions or derivative works, remain free and open source, preserving the same freedoms for all downstream users. **(2pts)**

Part IV – Scenario based Items (total 8pts)

Instruction: Read the scenario carefully and then answer the related question(s) that follow. Provide thorough, well-reasoned responses based on the information given in the scenario.

Scenario:

"CodeCraft," a vibrant open-source project, is a developer tool licensed under the **Apache 2.0** license. It has gained significant popularity. The project's core team has relied on community donations and a few corporate sponsors.

A large cloud provider, "MegaCloud," begins offering a highly optimized, managed version of CodeCraft as a premium SaaS product. MegaCloud invests heavily in engineering, adds valuable enterprise features, and attracts many of CodeCraft's potential paying customers. However, they contribute very few of their improvements back to the main CodeCraft project.

The CodeCraft core team feels that MegaCloud is "strip-mining" their community project for profit without reciprocating, threatening the project's sustainability.

Your Task:

As a leader of the CodeCraft project, you are considering a strategic change to address this.

1. **License Change Analysis:** You propose changing the project's license from Apache 2.0 to the **AGPLv3**. Explain the specific *practical effect* this change would have on MegaCloud's service. **(3 pts)**
2. **Business Model Proposal:** To create a sustainable revenue stream for the core team, you suggest adopting an "Open Core" model. Briefly describe what this would look like for the CodeCraft project. **(2 pts)**
3. **Community Impact:** What is one potential *risk* or *drawback* of making this license change for the wider CodeCraft community and its adoption? **(1 pt)**