MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

UNIVERSITY ORDINARY EXAMINATION

2023/2024 ACADEMIC YEAR

THIRD YEAR **FIRST** SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING

SCS308: OPEN SOURCE TRENDS

DURATION: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Answer question one and any other two questions.

2. Mobile phones are not allowed in the examination room.

3. You are not allowed to write on this examination question paper.

SECTION A – ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

a. Open source software is sometimes known as "free software". What three "freedoms" is associated to it? (3 marks)
b. By use of a relevant examples in each case, explain any two common categories of intellectual property. (4 marks)
c. You work for an organisation that really needs the services of ERP systems yet it is resource constrained. A friend advises you to change over to OSS. What two advantages do you think OSS will provide to the organisation? (4 marks)
d. Apart from OSS, the open source philosophy has been adopted in other areas of working. Identify any three areas and explain how the concept has been used. (6 marks)
e. Open Source Software are created by communities. Due to the geographical spread of participants, effective communication is key. Explain any three ways in which members can use to communicate effectively. (6 marks)
f. Explain any three reasons why documentation is important in an OSS project. (3 marks)
g. State any two roles that OSS play in emerging technologies
   i. AI (2 marks)
   ii. IoT (2 marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

a. As a software engineer your colleague consults you to help them differentiate proprietary software from OSS. What four features can you identify to explain to them. (4 marks)
b. There are varieties of OSS licences available to use for an institution like MUT. What license can you recommend? Give a reason for your answer. (2 marks)
c. What three things can OSS contributors expect to receive from their contributions? (3 marks)
d. State and explain the two ways in which the version control of OSS project can be achieved. (4 marks)
e. What three advantages does a proprietary software have over OSS? (6 marks)
f. What is the main difference between white box and black box testing? (1 mark)

QUESTION THREE (20 MARKS)

a. Explain the following terms. (2 marks)
   i. Private build
   ii. Release build
b. State and explain any three ways in which government and public organisations can leverage open source solutions. (6 marks)

c. One of the benefits of adopting open source working methodology is to "release early and release often". What does this phrase mean? (2 marks)

d. Handling an open source project involves thousands of people from different backgrounds. For any effective communication to be achieved, there must be etiquette and some specific communication guidelines. Explain any three. (6 marks)

e. OSS project start with an individual idea which is then "sold" to others. To create awareness of the idea, what two ways can you use and how can they be used? (4 marks)

QUESTION FOUR (20 MARKS)

a. In community driven projects, groups performing similar jobs form sub-teams within themselves. Explain the role of the following groups. (6 marks)
   i. Builders group
   ii. Release management group
   iii. Customers

b. Despite the popularity, some people do not use OSS. What three challenges do users face when using these software? (6 marks)

c. Open source software like any other need testing before implementation. Explain any three levels of testing that the project can undergo. (6 marks)

d. By using an example in each case, elaborate any two features of OSS. (2 marks)