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UNIVERSITI TUN ABDUL RAZAK

FINAL EXAMINATION
NOVEMBER 2023

COURSE TITLE	**SOFTWARE QUALITY AND METRICS**
COURSE CODE	**RCIT3733**
DATE/DAY	**22 FEBRUARY 2024 / THURSDAY**
TIME/DURATION	**02:00 PM - 04:00 PM / 02 Hour(s) 00 Minute(s)**

INSTRUCTIONS TO CANDIDATES :

1. Please read the instruction under each section carefully.
2. Candidates are reminded not to bring into examination hall/room any form of written materials or electronic gadget except for stationery that is permitted by the Invigilator.
3. Students who are caught breaching the Examination Rules and Regulation will be charged with an academic dishonesty and if found guilty of the offence, the maximum penalty is expulsion from the University.

(This Question Paper consists of 7 Printed Pages including front page)

DO NOT OPEN THE QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO

This question paper consists of TWO (2) sections. Answer ALL questions in the answer booklet provided. **[50 MARKS]**

SECTION A **(20 Marks)**

There are TWENTY (20) questions on this part of the examination paper. Answer ALL questions in the answer booklet.

1. What is software quality?
   A. The number of features in the software
   B. The degree to which software meets its requirements
   C. The cost of developing the software
   D. The time taken to complete the software project

2. Which of the following is not a key attribute of software quality?
   A. Reliability
   B. Maintainability
   C. Testability
   D. Complexity

3. What is the purpose of software testing in the context of quality assurance?
   A. To find and fix all bugs in the software
   B. To ensure that the software meets the specified requirements
   C. To speed up the software development process
   D. To add new features to the software

4. Which metric is used to measure the density of defects in the software code?
   A. Cyclomatic complexity
   B. Defect density
   C. Code coverage
   D. Fault tolerance

5. What does the term "ISO 9126" refer to in the context of software quality?
   A. A software development methodology
   B. A set of guidelines for software testing
   C. An international standard for software quality characteristics
   D. A code analysis tool

6. Which software quality characteristic is concerned with the accuracy and consistency of data processing?
   A. Reliability
   B. Functionality
   C. Efficiency
   D. Integrity

7. What does the term "ISO 25010" refer to in the context of software quality?
   A. A code analysis tool
   B. A set of guidelines for software testing
   C. An international standard for software quality requirements
   D. A software development methodology

8. What is the purpose of load testing in software quality assurance?
   A. To identify and mitigate potential security vulnerabilities
   B. To evaluate the software's ease of use
   C. To simulate real-world usage conditions and assess performance
   D. To execute test cases automatically

9. Which software quality attribute focuses on the software's ability to recover from failures and errors?
   A. Reliability
   B. Availability
   C. Usability
   D. Efficiency

10. What does the term "ISO 9001" refer to in the context of software quality assurance?
    A. A code analysis tool
    B. A set of guidelines for software testing
    C. An international standard for quality management systems
    D. A software development methodology

11. What is the purpose of software quality metrics?
    A. To increase the complexity of the code
    B. To measure the effectiveness of software testing
    C. To add unnecessary features to the software
    D. To reduce the software development timeline

12. What is the purpose of "code coverage" as a software quality metric?
    A. To assess the maintainability of the code
    B. To measure the efficiency of the testing process
    C. To evaluate the number of defects per line of code
    D. To track the frequency of code changes

13. Which metric assesses the extent to which a software product can be adapted for different operating environments?
    A. Evaluates the code without executing it
    B. Measures the number of defects found during testing
    C. Assesses the software's performance under stress conditions
    D. Tracks the frequency of code changes

14. What does the term "static analysis" contribute to software quality metrics?
    A. register
    B. NOR gate
    C. flip-flop
    D. XOR gate

15. Which metric assesses the capability of software to recover from failures and errors?
    A. Reliability
    B. Maintainability
    C. Portability
    D. Efficiency

16. What does the "mean time to failure" metric measure in software reliability?
    A. The average time taken to fix defects
    B. The average time between system failures
    C. The average lines of code per module
    D. The average time spent on software testing

17. What does the term "software aging" refer to in the context of software reliability metrics?
    A. The deterioration of software performance over time
    B. The frequency of code changes over time
    C. The independence of software components
    D. The efficiency of the testing process

18. Which metric evaluates the ability of software to adapt to changes in its environment?
    A. Code churn
    B. Adaptability
    C. Portability
    D. Requirements volatility

19. What does the term "benchmarking" refer to in the context of software quality metrics?
    A. Comparing the performance of software against industry standards
    B. The frequency of code changes over time
    C. The independence of software components
    D. Measuring the efficiency of the testing process

20. Which testing type is focused on verifying that the software works correctly after a new version or update is deployed?

    A. Regression testing
    B. Acceptance testing
    C. Alpha testing
    D. Beta testing

SECTION B **(30 Marks)**

There are TWO (2) questions in this part of the examination paper. Answer ALL questions in the answer booklet.

1. Software product quality metrics is one of the metrics that have been used by the software engineering professionals to be measure the quality of a product.

    a) Define software product quality metrics.

    (2 marks)

    b) List down the **TWO (2)** classes that have been classified under software product quality metrics.

    (2 marks)

    c) KLOC is one of the approaches offered under software product quality metrics. Describe the KLOC approach.

    (2 marks)

    d) List down **THREE (3)** attributes related to software product quality metrics.

    (3 marks)

    e) Explain the **THREE (3)** attributes mentioned in **Q1(d)**.

    (6 marks)

2. Software process quality metrics is one of the metrics that have been used by the software engineering professionals to be measure the quality of processes.

   a) Define software process quality metrics.

   (2 marks)

   b) List down the **FOUR (4)** classes that have been classified under software process quality metrics.

   (4 marks)

   c) Describe **THREE (3)** of the classes mentioned in **Q2(b)** by giving examples of each metrics.

   (9 marks)

***** END OF QUESTION PAPER *****