KATHMANDU UNIVERSITY
End Semester Examination
January/February 2024

Marks Scored:

Level : B.Tech.
Year : II

Course : AICS 203
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date : 25-Jan.

SECTION "A"

[20Q. × 0.5 = 10 marks]

Choose and encircle in the most appropriate option from each set of choices.

1. What is Software Engineering?
   a. Designing a software
   b. Testing a software
   c. Application of engineering principles to the design of a software
   d. documentation and configuration of data

2. *"Software engineers should not use their technical skills to misuse other people's computers."* Here the term ***misuse*** refers to:
   a. Unauthorized access to computer material
   b. Unauthorized modification of computer material
   c. Dissemination of viruses or other malware
   d. All of the mentioned above

3. Which of the following activities of a Generic Process framework provides a feedback report?
   a. Communication
   b. Planning
   c. Modeling and Construction
   d. Deployment

4. What is the disadvantage of the Spiral Model?
   a. Does Not work well for smaller projects
   b. The high amount of risk analysis
   c. Additional Functionality can be added later
   d. Strong approval and documentation control

5. How many phases are there in Scrum ?
   a. Two
   b. Three
   c. Four
   d. Scrum is an agile method which means it does not have phases

6. Which four framework activities are found in Extreme Programming(XP) ?
   a. Analysis, Design, Coding, Testing
   b. Planning, Analysis, Design, Coding
   c. Planning, Design, Coding, Testing
   d. Planning, Analysis, Coding, Testing

7. Which one of the following is **NOT** a step of requirement engineering?
   a. Elicitation
   b. Design
   c. Analysis
   d. documentation

8. Which is the developer-specific requirement ?
   a. Portability
   b. Maintainability
   c. Availability
   d. Both Portability and Maintainability

9. _____ allows us to infer that different members of classes have some common characteristics.
a. Realization b. Aggregation c. Generalization d. Dependency

10. Which of the following is **NOT** included in Architectural design decisions?
a. Type of application
b. Distribution of the system
c. Architectural styles
d. Testing the system

11. Which of the following patterns is the basis of interaction management in many web-based systems?
a. Architecture
b. Repository pattern
c. Model-View-Controller
d. Different operating system

12. What translates a natural or an artificial language into another representation of that language and, for programming languages, also executes the resulting code?
a. ERP systems
b. Transaction-based information systems
c. Language processing systems
d. None of the mentioned

13. In which test design each input is tested at both ends of its valid range and just outside its valid range?
a. Boundary value testing
b. Equivalence class partitioning
c. Boundary value testing AND Equivalence class partitioning
d. Decision tables

14. Which diagram in UML emphasizes the time-ordering of messages?
a. Activity b. Sequence c. Collaboration d. Class

15. Which granularity level of testing checks the behavior of module cooperation?
a. Unit Testing
b. Integration Testing
c. Acceptance Testing
d. Regression Testing

16. Quality Management is known as _____
a. SQI b. SQA c. SQM d. SQA and SQM

17. A set of inputs, execution preconditions and expected outcomes is known as a
a. Test plan b. Test case c. Test document d. Test Suite

18. Which technique is applied to ensure the continued evolution of legacy systems ?
a. Forward engineering
b. Reverse Engineering
c. Reengineering
d. Reverse Engineering and Reengineering

19. Which of the following is **NOT** a part of Software evolution?
a. Re-engineering activities
b. Maintenance activities
c. Development activities
d. Negotiating with client

20. In which step of SDLC actual programming of software code is done?
a. Development and Documentation
b. Maintenance and Evaluation
c. Design
d. Analysis

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Level : B.Tech. 25 — Course : AICS 203
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Time : 2 hrs. 30mins. F. M. : 40

SECTION "B"
[6 Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. Describe why is it important to use software engineering techniques when developing a professional software product instead of just building the system in whatever way it appears to be "quick and easy"? List four important attributes of a software. [3+1= 4]

2. Explain why change is inevitable in complex systems and give examples of software process activities that help predict changes and make the software being developed more resilient to change. [4]

3. What is an architectural pattern? Describe the types of architecture patterns in brief. [1+3 = 4]

4. What do you understand by configuration management? Using examples, explain why configuration management is important when a team of people are developing a software product. [1+3 = 4]

5. What are the main review types to achieve software quality assurance? Explain the major roles and steps during software inspection. [4]

6. Define legacy systems. What are the strategic options for evolution of legacy systems? When would you normally replace all or part of a system rather than continue maintenance of the software? [4]

7. Write short notes on (*ANY TWO*) : [2+2 =4]
   a. Client Server Architecture
   b. Types of User Testing
   c. Open Source Licensing

SECTION "C"
[2Q × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. a. Why is requirement engineering considered the most essential step in the Software Development Life Cycle? [2]
   b. Describe the steps of requirement engineering. [2]
   c. Explain the ways of writing a system requirements specification with suitable examples. [4]

9. a. What do you understand about agile software development? [1]
   b. Describe briefly the 12 agile principles outlined in the Agile Manifesto. [4]
   c. Explain how the principles underlying agile methods lead to the accelerated development and deployment of software. [2]
   d. When would you recommend against the use of an agile method for developing a software system? [1]

10. One common example of application of Artificial Intelligence in healthcare is *Personalized Medication and Care*. AI solutions could be developed to find the best treatment plans according to patient data. Such applications can provide custom-tailored medication or care plans for the patients by using their medical history, genetic profile, and other related information.
   a. Draw a context diagram for the case described for *Personalized Medication and Care.* [2]
   b. Identify the top-level functional requirements for the *Personalized Medication and Care*, and model it with a use case diagram. [2]
   c. Draw an interaction diagram for one of the use cases in 10 a). [2]
   d. Draw class diagram for the *Personalized Medication and Care* system described above [2]