



The University of Fiji
(An Entity of Arya Pratinidhi Sabha of Fiji)



SCHOOL OF SCIENCE AND TECHNOLOGY
Semester 1: Year 2023



FINAL EXAMINATION PAPER

ITC213: SYSTEMS ANALYSIS AND MODELING

Important Instructions to Students:

1. Read the questions, instructions carefully and answer the questions.
2. You are allowed an **extra 10 minutes reading time** (during this time, you are not allowed to write with pen) and **180 minutes (3 Hours) to complete this paper**.
3. Silent, non-programmable calculators are allowed, but not supplied.
4. Write all your answers in the answer booklet provided. If you need extra sheets, please ask from the supervisor. Write your name, course code and student identification number in the answer booklet and in the attendance sheet.
5. **This Final Examination Paper is worth 100 marks contributes 50% of the total course assessments.** Students must **at least score 40%** in this final exam to pass the course.
6. This paper contains two (2) sections A and B. All questions are compulsory to answer.
7. Write all your answers legibly. The marker has the right to award zero for answers that are not legible.
8. This is a **Closed Book Examination**. The University views plagiarism, cheating and dishonest practice as serious offences and if found, offenders are penalized.

Examination Paper Content (Format):

<u>Section</u>	<u>Question</u>	<u>Content</u>	<u>Marks</u>	<u>Suggested Time</u>
A	1-40	Multiple Choice	40	72 minutes
B	1-22	Open Ended Questions	60	108 minutes
		TOTAL	100	180 Minutes

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Write the question number and the letter which represents the **most** appropriate answer for each question in the answer booklet.

1. _____ is a systems development technique that tests system concepts and provides an opportunity to examine input, output, and user interfaces before final decisions are made.
 - a. Scrum
 - b. Prototyping
 - c. Modeling
 - d. Rapid application development

2. While measuring the feasibility, questions such as “Does management support the project?” and “Will the new system require training for users?” would help predict a system’s _____.
 - a. schedule feasibility
 - b. technical feasibility
 - c. economic feasibility
 - d. operational feasibility

3. In Project planning, an activity of a project manager, _____.
 - a. requires guiding, supervising, and coordinating the a project team’s workload
 - b. includes monitoring the progress of the a project, evaluating results, and taking corrective action when necessary to stay on target
 - c. focuses on long-term challenges and goals, the importance of stakeholders, and a commitment to the firm’s role as a corporate citizen
 - d. includes identifying project tasks and estimating completion times and costs

4. To obtain answers to requirements questions, the analyst develops a _____ plan, which involves answers to five familiar questions: who, what, where, when, and how.
 - a. stratification
 - b. fact-finding
 - c. rapid application
 - d. sequencing

5. When phrasing interview questions, a systems analyst should avoid _____ that suggest or favor a particular reply.
 - a. range-of-response questions
 - b. open-ended questions
 - c. closed-ended questions
 - d. leading questions

6. In a(n) _____ structure, which usually is based on interpersonal relationships, some people have more influence or knowledge than appears on an organization chart.
- a. spontaneous
 - b. unstructured
 - c. informal
 - d. open-ended
7. When a message is sent from an originating object to a destination object it means that _____.
- a. data is being passed from the origin object to the destination object
 - b. a transition is occurring between the objects
 - c. a method is being invoked on the originating object
 - d. a method is being invoked on the destination object
8. To evaluate _____, a systems analyst needs information about projected future volume for all outputs, inputs, and processes.
- a. scalability
 - b. reliability
 - c. compatibility
 - d. applicability
9. A(n) _____ shows the timing of interactions between objects as they occur.
- a. timing diagram
 - b. class diagram
 - c. orientation diagram
 - d. sequence diagram
10. A(n) _____ is a characteristic or feature that must be included in an information system to satisfy business needs and be acceptable to users.
- a. system requirement
 - b. property
 - c. questionnaire
 - d. object
11. A _____ is a requirement or condition that a system must satisfy or an outcome that a system must achieve.
- a. trigger
 - b. constraint
 - c. query
 - d. key

12. Determining the _____ means defining the specific boundaries, or extent, of a project.
- project index
 - project matrix
 - project scope
 - project table
13. _____ limitations result when a system that was designed for a specific hardware configuration becomes obsolete when new hardware is introduced.
- Accessibility
 - Relationship
 - Feasibility
 - Performance
14. The overall aim of a _____ is to avoid seeking goals that are unrealistic, unprofitable, or unachievable.
- SWOT (strengths, weaknesses, opportunities, and threats) analysis
 - CSF (critical success factor) analysis
 - BCF (business case factor) analysis
 - SWCT (strategy, weakness, cost, and technology) analysis
15. A(n) _____ investigates, analyzes, designs, develops, installs, evaluates, and maintains a company's information systems.
- application developer
 - database administrator
 - network administrator
 - systems analyst
16. In object-oriented analysis, objects possess characteristics called _____.
- properties
 - orientations
 - classes
 - inheritances
17. In a(n) _____ model, the result of each phase is called a deliverable, which flows into the next phase.
- interactive
 - iterative
 - waterfall
 - spiral

18. Structured analysis is a traditional systems development technique that uses a series of phases, called the _____, to plan, analyze, design, implement, and support an information system.
- a. object-oriented (O-O) analysis
 - b. systems development life cycle (SDLC)
 - c. transaction processing (TP) system
 - d. enterprise resource planning system (ERP)
19. One of the disadvantages of _____ methods of system development is that the overall project might be subject to scope change as user requirements change.
- a. object-oriented analysis
 - b. agile
 - c. structured analysis
 - d. rapid application development
20. The _____ method of developing systems produces code that is modular and reusable.
- a. object-oriented analysis
 - b. adaptive
 - c. structured analysis
 - d. rapid application development
21. _____ is a systems development technique that produces a graphical representation of a concept or process that systems developers can analyze, test, and modify.
- a. Prototyping
 - b. Rapid application development
 - c. Scrum
 - d. Modeling
22. Business support systems _____.
- a. provide job-related information support to users at all levels of a company
 - b. simulate human reasoning by combining a knowledge base and inference rules that determine how the knowledge is applied
 - c. process data generated by day-to-day business operations
 - d. include email, voice mail, fax, video conferencing, word processing, automated calendars, database management, spreadsheets, and integrated mobile computing systems

23. A _____ is an overview that describes a company's overall functions, processes, organization, products, services, customers, suppliers, competitors, constraints, and future direction.
- a. business matrix
 - b. business profile
 - c. business index
 - d. business glossary
24. When planning an information system, a company must consider how a new system will interface with older systems, which are called _____.
- a. enterprise applications
 - b. network operating systems (NOS)
 - c. operating applications
 - d. legacy systems
25. An object's _____ are the tasks or functions that the object performs when it receives a command to do so.
- a. roles
 - b. utilities
 - c. instances
 - d. methods
26. The Unified Modeling Language (UML) represents an object as a _____ with the object name at the top, followed by the object's attributes and methods.
- a. circle
 - b. rectangle
 - c. pentagon
 - d. rhombus
27. In a sequence diagram, a _____ represents the time during which an object above it is able to interact with the other objects in the use case.
- a. focus point
 - b. schematic matrix
 - c. validity link
 - d. lifeline

28. For a use case diagram, the _____ shows what is included in the system and what is not included in the system.
- a. system design
 - b. system boundary
 - c. system layout
 - d. system matrix
29. _____ describe what objects need to know about each other, how objects respond to changes in other objects, and the effects of membership in classes, superclasses, and subclasses.
- a. Instances
 - b. Relationships
 - c. Aggregates
 - d. Clusters
30. An object can be viewed as a(n) _____, because a message to the object triggers changes within the object without specifying how the changes must be carried out.
- a. black box
 - b. class diagram
 - c. use case
 - d. activity diagram
31. The concept that a message gives different meanings to different objects is called _____.
- a. encapsulation
 - b. dynamic addressing
 - c. polymorphism
 - d. linear addressing
32. A(n) _____ resembles a verb and defines specific tasks that an object can perform.
- a. attribute
 - b. method
 - c. command
 - d. message
33. The _____ of an object is an adjective that describes the object's current status.
- a. polymorphism
 - b. encapsulation
 - c. resemblance
 - d. state

34. Objects within a class can be grouped into _____, which are more specific categories within a class.
- a. grids
 - b. units
 - c. subclasses
 - d. matrices
35. The black box concept is an example of _____, which means that all data and methods are self-contained.
- a. polymorphism
 - b. inheritance
 - c. encapsulation
 - d. use case modeling
36. The purpose of a use case is to _____.
- a. identify a sequence of steps to process a user function
 - b. identify a business event that requires system action
 - c. identify a useful objective for the new system
 - d. identify a user and describe one user procedure
37. An information system consists of _____.
- a. software, database, and manual processes
 - b. software, hardware, and network
 - c. software, hardware, and database
 - d. applications, screens, and database
38. A class can belong to a more general category called a _____.
- a. superclass
 - b. register
 - c. subclass
 - d. catalog
39. A red Tesla is a(n) _____ of the CAR class.
- a. index
 - b. key
 - c. metric
 - d. instance

40. Which of the following is normally the most time-consuming and resource-expensive operation?
- Building prototypes
 - Observing business processes
 - Researching vendor solutions
 - Interview stakeholders

SECTION B

OPEN - ENDED QUESTION

60 MARKS

Answer ALL the questions from this section in the answer booklet provided.

1. By the use of an example explain what is meant by "corporate culture" and why is it important in systems analysis and modelling? *(2 marks)*
2. Do most firms give their IT budgets a low priority in good economic times? Yes or no? Explain in your own words why you think so. *(2 marks)*
3. "Information systems are models or simulations of the real world". Discuss the benefits and the disadvantages of thinking of information systems as stated in the statement above. *(2 marks)*
4. With help of an example explain why boundary and environment are important for understanding a system? *(2 marks)*
5. Explain what are the relationships between business goals, information systems strategy and information technology strategy? *(2 marks)*
6. Discuss with help of an example, what does it mean to say that an object-oriented system is highly modular. Explain in your own words. *(2 marks)*
7. Use examples to discuss the main differences between quality problems and productivity problems. *(2 marks)*
8. Discuss some of the possible reasons that may cause requirements to drift once a project has started. *(2 marks)*
9. Compare and contrast the UML notations for package, subsystem and model. Make sure to explain in your own words. *(2 marks)*
10. Discuss the pros and cons of agile methods. *(3 marks)*
11. Use an example and thoroughly discuss how the object-oriented approach of message passing helps to hide the implementation of an object, including its data. *(2 marks)*

12. List and explain the usability, functional and non-functional requirements of a movie booking system. (6 marks)
13. Use an example to explain the concept of inheritance. (2 marks)
14. Consider an employee object. Identify some plausible behavior and states for this object. In your own words, discuss these behavior and states of the employee object. (2 marks)
15. For what kind (or kinds) of project might it be inappropriate to use an object-oriented approach to information systems development? Discuss at least three and thoroughly explain your answer. (3 marks)
16. Discuss the similarities and difference between an activity diagram and a use case diagram. (2 marks)
17. Explain what is feedback and how does it relate to system analysis. Compare and contrast positive and negative feedback with help of one practical example for each and explain how it applies to an automatic control system, and one practical example of how it applies to a human activity system. (2 marks)
18. What does architecture mean in information systems development and why is there a need to produce system architecture models? Discuss the types and views of system architecture. Discuss the Kruchten - RUP's 4 + 1 views thoroughly. (3 marks)
19. Discuss some of the factors that influence the architecture of a system in terms of existing systems, enterprise architectures, and technical reference architectures. (2 marks)
20. List and discuss the functional and non-functional requirements for an e-ticketing system for public transport. (5 marks)
21. Write the Object Constraint Language (OCL) expression for a marriage compatibility system. Make sure to define constraints that capture rules and conditions related to the compatibility of individuals. Explain each constraint well. (5 marks)
22. Create an activity diagram with all the standard notations for using an ATM machine. Make assumptions wherever required but make sure to include the following:
 - a. All the activities that could occur during the process. Make sure you follow the correct sequence of activities that is involved in the process.
 - b. Include decision points in your diagram and include a few if/else statements or loops where a decision needs to be made.
 - c. Add additional elements, such as swimlanes to separate activities performed by different actors, or notes to provide additional information.(5 marks)

End of Exam