

KATHMANDU UNIVERSITY
End Semester Examination
July/August, 2024

Marks Scored:

Level : B.E./B.Sc.

Year : III

Course : COMP 302

Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date

26 JUL 2024

SECTION "A"

[20 Q. × 0.5 = 10 marks]

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

1. System design is carried out
 - a. As soon as the system requirements are determined
 - b. Whenever a system analyst feels it is urgent
 - c. After the final system specifications are approved by the organization
 - d. whenever the management feels it should be done

2. Which of the following is not a factor in the failure of the systems development projects?
 - a. Size of the company
 - b. Inadequate user involvement
 - c. Failure of systems integration
 - d. Continuation of a project that should have been canceled

3. During the maintenance phase
 - a. System requirements are established
 - b. System analysis is carried out
 - c. Programs are tested
 - d. Make necessary changes or carry out updates

4. System prototyping helps the designer in
 - a. Making the programmers understand how the system will function.
 - b. Communicating to the user quickly, provide insights on how the system will look like when developed, and get feedback for further processes.
 - c. Giving a demo of the software, to the system manager to whom he reports
 - d. Brief system analysis

5. Requirements also serve as an evaluation checklist at the end of the development project, so they are sometimes called _____
 - a. System Development Life Cycle
 - b. CASE tool
 - c. Phased Conversion
 - d. Success factors

6. The primary responsibility of a systems analyst is to
 - a. Specify an information system that meets the requirements of an organization
 - b. Write programs to meet specifications
 - c. Maintain the system
 - d. Meet managers of the organization regularly

7. A context diagram
 - a. describes the context of a system
 - b. is a DFD that gives an overview of the system
 - c. is a detailed description of a system
 - d. is not used in drawing a detailed DFD

8. Data cannot flow from an external entity to an external entity because
 - a. It will get corrupted
 - b. It is not allowed in DFD
 - c. An external entity has no mechanism to read or write
 - d. Both are outside the context of the system

9. A decision table is
 - a. A truth table
 - b. A table that facilitates taking decisions
 - c. A table listing conditions and actions to be taken based on the testing of conditions
 - d. A Decision Support System

10. A data dictionary has information about
 - a. Every data element in a data flow
 - b. Only key data element in a data flow
 - c. Only important data elements in a data flow
 - d. Only numeric data elements in a data flow

11. A relationship is
 - a. An item in an application
 - b. A meaningful dependency between entities
 - c. A collection of related entities
 - d. Related data

12. Normalization _____ data duplication.
 - a. eliminates
 - b. reduces
 - c. increases
 - d. maximizes

13. _____ captures the intended behavior of a system.
 - a. Use Case
 - b. Component
 - c. Class
 - d. State diagram

14. What is the purpose of a sequence diagram?
 - a. To show the interactions between actors and a system
 - b. To show the behavior of objects in a system
 - c. To show the flow of activities in a system
 - d. To show the order and timing of interactions between objects

15. Select the people/team who identify the document and verifies the correctness of the software:
 - a. Project manager
 - b. SQA team
 - c. Project team
 - d. Program developer

16. The review type _____ is used for reviewing safety-critical components in a software project, a more formal, documented review, based on rules and checklists needed.
 - a. informal review
 - b. walkthrough
 - c. inspection
 - d. technical review

17. The agile software development model is built based on _____.
 - a. Linear Development
 - b. Incremental Development
 - c. Iterative Development
 - d. Both Incremental and Iterative Development

18. The rapid application development model is
 - a. Another name for computer-based development
 - b. A useful approach when a customer cannot define requirements clearly
 - c. A high speed adaptation of the linear sequential model
 - d. Traditional model for quick software development

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19. Given is a relation project guidance

Project Guidance (professor, project, student no., st-name, dept)

A professor can give many projects to many students. A project will have many students and project may be guided by many professors

The 4 NF relation corresponding to this are

- a. Prof_Project (professor, st_name, dept)
Proj_stud (project, student no.)
- b. Prof_stud (professor, student no)
Proj_stud (project, student no)
Student (student no, st_name, dept)
- c. Student (student no, st_name, dept)
Professor(professor, project)
- d. Professor(professor, project, dept)
Student (student no, st_name, dept)

20. A relation is said to be in BCNF when

- a. It has overlapping composite keys
- b. It has no composite keys
- c. It has no multivalued dependencies
- d. It has no overlapping composite keys which have related attributes

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SECTION "B"

[6Q. × 4 = 24 marks]

Attempt *ANY SIX* questions. Write the answers in your own words as far as practicable.

1. Define information systems. Imagine an information system developed without using any analysis or design methods and without thinking about software development life cycle (SDLC). Describe the possible consequences that could couple with the information system developed with this approach. [1+3=4]
2. List out the major steps during project identification and selection. Which would you prefer, a top-down or bottom-up strategy for project identification and selection, explain? [2+2=4]
3. How can prototyping be used for requirements determination? Describe if it is advantageous or not over the traditional methods? [3+1=4]
4. How does ER Modeling help system analysts during database analysis?
Draw E-R diagrams with attributes, cardinality, and identifiers for the given description:
A database for Library Management System (LMS), keeps track of library staff with their respective login_id and password. The library staff are supposed to maintain book catalogs with ISBN, book_title, category, author, publisher, year_of_publication, edition, etc. A publisher has a publisher_id and a list of publications. Library members (generally students) have user_id, email, name (f_name, m_name, l_name), address, phone number (two or more entries are allowed) and department affiliated to the university. The members of the library can borrow, reserve and return the books on certain dates. The library staff maintain records of these members. The library staff also generates reports of the members with the books borrowed, due date, etc. [1+3=4]
5. What is SQA? Explain the steps during software inspection. [1+3=4]
6. Describe your semester project in brief? What process model did you use for developing the project: the waterfall model, evolutionary models, Spiral model or something else? Give your justification. [1+3=4]
7. Write Short notes (*ANY TWO*) [2+2=4]
 - a. Spiral model of software development
 - b. Use of CASE tools during system analysis
 - c. Walkthrough as a product review technique

P.T.O.

SECTION "C"

[2Q.× 8 = 16 marks]

Attempt ANY TWO questions. Write the answers in your own words as far as practicable

8.
 - a. Why do systems analysts use Data Flow Diagrams (DFDs)? List out the key rules for drawing DFDs. [1+3=4]
 - b. Develop a Context diagram and Level-0 DFD for a general e-commerce application. [1+3=4]

9.
 - a. How do you know when to use Structured English, Decision Tree or Decision Tables? Provide appropriate examples for each. [3]
 - b. Adarsha is trying to decide which graduate programs he will apply to. He wants to stay in the western province of Nepal but if a program is considered one of the top 3 in the country, he is willing to move to another part of the country. Adarsha is interested in both the MBA and Master of Management Information Systems programs. An MBA program must have at least one well-known faculty member and meet his location requirements before he will consider applying to it. Additionally, any program he applies to must offer financial aid, unless he is awarded a scholarship. Use a decision table to represent this logic. [5]

10. Suppose you want to develop an information system for a university. A student can enroll to a program at a department in a university. The student registers mandatory courses and can also take electives as per the rules. The student performs other activities like fee payment, sit in the examinations and view results. Make other necessary assumptions and model the system.
 - a. Identify the top-level functional requirements for the university system, and model it with use case diagram/s. [4]
 - b. Develop a sequence diagram for a use case scenario. [4]