UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)
Academic Year 2020 – 1st Year Examination – Semester 2

IT2405: Systems Analysis and Design (R)
Multiple Choice Question Paper

(TWO HOURS)

Important Instructions :

- The duration of the paper is 2 (two) hours.
- The medium of instruction and questions is English.
- The paper has **50 questions** and **12 pages**.
- All questions are of the MCQ (Multiple Choice Questions) type.
- All questions should be answered.
- Each question will have 5 (five) choices with **one or more** correct answers.
- All questions will carry equal marks.
- There will be a penalty for incorrect responses to discourage guessing.
- The mark given for a question will vary from 0 (*All the incorrect choices are marked & no correct choices are marked*) to +1 (*All the correct choices are marked & no incorrect choices are marked*).
- Answers should be marked on the special answer sheet provided.
- Note that questions appear on both sides of the paper.
  If a page is not printed, please inform the supervisor immediately.
- Mark the correct choices on the question paper first and then transfer them to the given answer sheet which will be machine marked. **Please completely read and follow the instructions given on the other side of the answer sheet before you shade your correct choices.**
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1) What is the best way of filling the blanks in the following two incomplete sentences?

……………… is a computer program that uses artificial-intelligence methods to solve problems within a specialized domain that ordinarily requires human expertise.

(a) Transaction processing system.
(b) Executive information system
(c) Expert system.
(d) Communication and Collaboration System.
(e) Office Automation System.

2) ………………… is a person who analyses a complex process or operation in order to improve its efficiency, especially by applying a computer system.

(a) A system user
(b) A system owner
(c) A systems analyst
(d) A project manager
(e) A system designer

3) Which of the following is/are correct regarding the stakeholders of an information system?

(a) Systems analysts frequently consult with management and users, and convey system requirements to software developers.
(b) System Programmer is a specialist who designs complex web sites and social media applications for organizations.
(c) System programmers are specialists who convert business requirements and statements of problems and procedures into computer languages.
(d) Web developers are responsible for all aspects of website development, from the design to the technical components.
(e) Business analysts identify business areas that can be improved to increase efficiency and strengthen business processes and often work closely with others.

4) Consider the following skills.
(i) Computer Programming knowledge
(ii) Good interpersonal communication skills
(iii) General knowledge of business processing

Which of the above skills is/are needed by systems analysts?

(a) Only (i)
(b) Only (i) and (ii)
(c) Only (ii) and (iii)
(d) Only (iii)
(e) (i),(ii) and (iii)

5) Which of the following is/are popular software process models?

> (a) The Waterfall model
> (b) Incremental development
> (c) Iterative development
> (d) Reuse-oriented software engineering
> (e) Software Development life Cycle

6) Fill in the blank below.

In the ……….. development process, the various phases of development are completed sequentially, one after the other.

> (a) Iterative
> (b) Waterfall
> (c) Agile
> (d) Spiral
> (e) Incremental

7) Which of the following would be considered when identifying system requirements?
(i) Funding process of the project
(ii) Correctness of the information by continuous result verification
(iii) Selecting of an integrated development environment for the programmers

> (a) Only (i)
> (b) Only (ii)
> (c) Only (iii)
> (d) Only (ii) and (iii)
> (e) (i), (ii) and (iii)

8) When requirements are not identified correctly, what could happen from among the following?

(i) The system may be delivered later than planned.
(ii) The system may be prone to errors.
(iii) The system may exceed the estimated cost.

> (a) Only (i)
> (b) Only (ii)
> (c) Only (i) and (ii)
> (d) Only (ii) and (iii)
> (e) (i), (ii) and (iii)

9) Consider the following requirements.
(i)   Users must change the initially assigned login password immediately after the first successful login.
(ii) The software should be portable so that moving from one OS to another OS does not create any problem.
(iii) Only Managerial level employees have the right to view revenue data.

Which of the above is/are non-functional requirements?

> (a) Only (i)   (b) Only (i) and (iii)   (c) Only (ii) and (iii)
> (d) Only (i) and (ii)   (e) (i), (ii) and (iii)

10) Fill in the blank space below.

.... phase in the system development life cycle defines business requirements for a new system.

(a) Requirement analysis	(b) Project initiation	(c) System design
(d) System development	(e) Scope definition	

11) Which of the following statements is/are correct regarding the Requirements Analysis Phase?

(a) It defines the business requirements of a new system.
(b) Programs are designed during this phase.
(c) During this phase all the Databases are created.
(d) It determines the worthiness of the project and creates a plan to complete it.
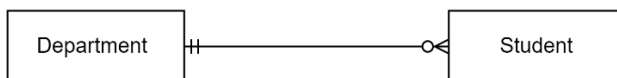(e) It identifies what the user needs and wants from the new system.

12) Some questions related to Data Modeling with possible answers are given below.
   (i) Q. Is the following statement correct?
      " In a Hotel Reservation system, *Room*, *Customer* and *Reservation Details* are entities"
      A. Yes
   (ii) Q. What is a Data Model?
      A. A Data model is made up of entities, which are the objects or concepts we want to track data about, and they become the tables in a database.
   (iii) Q. What is a *Relationship* in Data Modeling?
      A. It is a natural business association that exists between one or more entities.

   Which of the above answers is/are correct?

   (a) Only (ii)
   (b) Only (i) and (ii)
   (c) Only (ii) and (iii)
   (d) Only (i) and (iii)
   (e) (i), (ii) and (iii)

13) Consider the following diagram and corresponding statements.

   (i) The degree of the above relationship is 1.
   (ii) It is an example of a relationship with cardinality 1 to 0 or more.
   (iii) Student will belong to one Department

Which of the above statements is/are true?

   (a) Only (i)
   (b) Only (ii)
   (c) Only (iii)
   (d) Only (ii) and (iii)
   (e) (i), (ii) and (iii)

14) Consider the following statements related to Process modelling.

    (i) Logical process models show what the system is or does.
    (ii) Logical models are always implementation-dependent.
    (iii) Physical process models reflect technology choices and the limitations of those technology choices.

    Which of the above statements is/are correct?

    (a) Only (i)
    (b) Only (ii)
    (c) Only (iii)
    (d) Only (ii) and (iii)
    (e) (i), (ii) and (iii)

15) Fill in the blank space below.

    ……………. define the sources and destinations of information entering and leaving the system.

    (a) Primitive process
    (b) External entities
    (c) Datastore
    (d) Data flow
    (e) Process

16) Some questions related to data flow diagrams (DFDs) with possible answers are given below.

    (i) Q. What is an *Elementary Process*?
       A. It is a *Process* that can be decomposed further.
    (ii) Q. What is the symbol used to represent a Datastore in any methodology?
       A. It is a rectangle.
    (iii) Q. Is the following statement correct?
       "Information in a DFD is transformed from a one datastore to another via a process."
       A. Yes.

    Which of the above answers is/are correct?

    (a) Only (i)
    (b) Only (i) and (ii)
    (c) Only (ii) and (iii)
    (d) Only (iii)
    (e) (i), (ii) and (iii)

17) Which of the following is/are correct regarding Process and Data modelling?

    (a) A Context DFD gives a basic overview of the whole system or process being analyzed or modeled showing the system as a single high-level process, with its relationship to external entities.
    (b) Data modeling gives organizations a simple way to understand and optimize workflows by creating data-driven visual representations of key business processes
    (c) A Context DFD contains external entities.
    (d) Data flow is the route that data takes between the external entities, processes, and data store and is shown with arrows
    (e) Data can flow directly from a data store to an external agent in a DFD.

18) Some questions related to entity modeling with possible answers are given below.
  (i) Q. What is the number of entities that participate in a relationship called?
     A. Degree
  (ii) Q. What is the candidate key that will most commonly be used to uniquely identify a single entity instance called?
     A. A Primary key
  (iii) Q. Is the following statement correct?
     "Relationships may also exist between different instances of the same entity."
     A. No

Which of the above answers is/are correct?

(a) Only (i)	(b) Only (i) and (ii)	(c) Only (iii)
(d) Only (ii) and (iii)	(e) (i), (ii) and (iii)	

The blanks in Questions 19-24 have to be filled by selecting the most appropriate words/phrases from the list labelled (i) – (vii) below.
    (i) Cardinality
    (ii) Entity
    (iii) Subtype
    (iv) Inheritance
    (v) Primary Key
    (vi) Supertype
    (vii) Generalization

What is the most appropriate word/phrase to fill in the given blanks?

19) ……………. is a count of the number of times one entity can (or must) be associated with each occurrence of another entity.

(a) (i)	(b) (ii)	(c) (iii)
(d) (iv)	(e) (vi)	

20) An entity ……….. is a generic entity type that is related to one or more entity subtypes.

(a) (i)	(b) (ii)	(c) (iii)
(d) (vi)	(e) (vii)	

21) If a database table contains the names of people, its ……….. might be called "Person".

(a) (vii)	(b) (ii)	(c) (iv)
(d) (v)	(e) (vi)	

22) …………….. supports the concept of code reusability and reduces the length of the code in object-oriented programming.

(a) (vii)	(b) (ii)	(c) (iii)
(d) (iv)	(e) (v)	

23) When designing a Data Model for a *SavingAccount* you can have a .... entity of *SavingsAccount as Account* and its child entity can be *SuperSavings Account* that has specialized features

(a) (i)	(b) (ii)	(c) (iii)
(d) (iv)	(e) (vi)	

24) A *Room* entity can act as a ……. and entities such as *Single*, *Double, Suit* can be its subtype entities.

(a) (i)	(b) (ii)	(c) (iii)
(d) (vi)	(e) (vii)	

25) Consider the following statements.

i. Several processes in a DFD might execute in parallel.

ii. System modeling is the process of developing abstract models of a system, with each model presenting a different view of that system..

iii. Logical DFD is a diagram that will represent business and related activities.

Which of the above statements is/are correct?

(a) Only (i)	(b) Only (ii)	(c) Only (iii)
(d) Only (i) and (ii)	(e) (i), (ii) and (iii)	

26) Consider the following relationship types drawn using ERD Martin notation.

(i)

(ii)

(iii)

Identify the correct type of relationship?

(a) (i) one,	(ii) one or more	(iii) many
(b) (i) more than one	(ii) more than one	(iii) two
(c) (i) one or more	(ii) one or more	(iii) zero or more
(d) (i) zero or more	(ii) more than one	(iii) exactly one
(e) (i) exactly one	(ii) one or more	(iii) zero, one or more

27) The benefits that a system provides can be categorized into Tangible and Intangible benefits. Which of the following is/are tangible benefits?

(a) Better supplier relationships
(b) Fewer processing errors
(c) Increased credit losses
(d) Improved customer goodwill
(e) Improved employer morale

The blanks in the Questions 28 – 33 have to be filled by selecting the most appropriate words/phrases from the list labeled (i) – (vii) below . Note that one word/phrase may be used in more than one instance.

> (i) Object Diagram
> (ii) Unified Modelling Language
> (iii) Generalization
> (iv) Class Diagram
> (v) Inheritance
> (vi) Polymorphism
> (vii) Encapsulation

What is the most appropriate word/phrase to fill in the blanks?

28) ……………. is the concept wherein methods and/or attributes defined in a class can be reused by another class.

(a) (i)	(b) (ii)	(c) (iii)
(d) (iv)	(e) (v)	

29) ……………. means the ability to take multiple forms and in an object-oriented paradigm, it implies using operations in different ways, depending upon the instance they are operating upon.

(a) (i)	(b) (iv)	(c) (v)
(d) (vi)	(e) (vii)	

30) Through …………, the internal details of a class can be hidden from the outside permitting the elements of the class to be accessed from outside only through the interface provided by the class.

(a) (i)	(b) (iii)	(c) (v)
(d) (vi)	(e) (vii)	

31) ………………. helps to visualize, specify, construct, and document the artifacts of an object-oriented system.

(a) (i)	(b) (ii)	(c) (iii)
(d) (iv)	(e) (vii)	

32) ………………. is used for a wide variety of purposes, including both conceptual/domain modelling and detailed design modelling.

(a) (i)	(b) (ii)	(c) (iii)
(d) (iv)	(e) (vii)	

33) …………… is the process of extracting shared characteristics from two or more classes, and combining them into a generalized superclass.

(a) (i)	(b) (ii)	(c) (iii)
(d) (v)	(e) (vii)	

34) ……………… represents a specific instance of a class diagram at a certain moment in time.

(a) (i)	(b) (ii)	(c) (iii)
(d) (v)	(e) (vii)	

35) Which of the following is/are correct regarding using interviews for fact gathering?

> (a) Success of interviews depends on the systems analyst's human relations skill.
> (b) Interviews are very time-consuming, and therefore a costly approach.
> (c) Video conferencing facility permits the systems analyst to interview clients who are at distant locations.
> (d) Interviews do not permit the systems analyst to reword questions for each individual.
> (e) When using a video conferencing facility we can easily get everyone on the same date, and time.

The blanks in the Questions 36 – 39 have to be filled by selecting the most appropriate words/phrases from the list labeled (i) – (viii) below.

> (i) Operational Feasibility
> (ii) Candidate Systems Matrix
> (iii) Technical Feasibility
> (iv) Schedule Feasibility
> (v) Return on Investment (ROI)
> (vi) Economic feasibility
> (vii) Feasibility Analysis Matrix
> (viii) Feasibility Analysis

What is the most appropriate word/phrase to fill in the blanks?

36) …………… or return on costs is a ratio between net income and investment.

(a) (ii)	(b) (v)	(c) (vi)	(d) (vii)	(e) (viii)

37) ……………… is a measure of the cost-effectiveness of a project or solution.

(a) (ii)	(b) (v)	(c) (vi)	(d) (vii)	(e) (viii)

38) ……………… addresses the following issues.

- Is the proposed technology or solution practical?

- Do we currently possess the necessary technology (Hardware/Personnel) ?

(a) (i)	(b) (vi)	(c) (iii)	(d) (iv)	(e) (v)

39) …………. is a tool that does not analyze candidate solutions but is used to document similarities and differences among candidate systems.

(a) (i)	(b) (ii)	(c) (v)	(d) (vi)	(e) (vii)

40) Which of the following is/are correct regarding *Feasibility* and *Feasibility Analysis*

(a) Cultural *feasibility* deals with how the end-users feel about the proposed system.
(b) *Political feasibility* addresses the following issue.
"How will the working environment of end-users change? Can or will end-users and management adapt to the change?
(c) *Operational Feasibility* is a measure of how well a solution meets the identified system requirements to solve the problem.
(d) A feasibility study is an analysis that takes all of a project's relevant factors into account including economic, technical, legal, and scheduling considerations to ascertain the likelihood of completing the project successfully.
(e) Operational Feasibility is a measure of how well a solution can be implemented within existing legal and contractual obligations.

41) Consider the following statements regarding systems design:

(i) Interface and program design are part of system design techniques.
(ii) Prototyping approach is an iterative process involving a close working relationship between the designer and the users.
(iii) It defines tasks that focus on the specification of a detailed computer-based solution.

(a) Only (i)
(b) Only (ii)
(c) Only (i) and (ii)
(d) Only (i) and (iii)
(e) (i), (ii) and (iii)

42) Consider the following statements related to system design.

(i) Systems design is the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements.
(ii) Object-oriented design is the process of planning a system of interacting objects for the purpose of solving a software problem.
(iii) Modules in a system should be highly cohesive and tightly coupled.

Identify the correct statements from the above.

(a) Only (i)
(b) Only (ii)
(c) Only (i),(ii)
(d) Only (i), (iii)
(e) (i), (ii) and (iii)

43) Fill in the blank below with the choice(s) given.
………………..is a graphical representation that depicts relationships among people, objects, places, concepts or events within an information technology (IT) system.

(a) Entity Relationship Diagram
(b) Use case diagram
(c) Class Diagrams
(d) Structure Chart
(e) Event Diagram

44) Consider the following statements regarding the Scope Definition phase.

(i) It compiles a list of requirements together with the client, end-users, experts, and project team.
(ii) The database management system to be used for the project has to be identified during this phase.
(iii) During this phase an analyst will find out what the system must do and how it should be implemented.

Which of the above statements is/are correct?

(a) Only (i)	(b) Only (i) and (ii)	(c) Only (iii)
(d) Only (ii) and (iii)	(e) (i), (ii) and (iii)	

45) Consider the following statements related to computer ethics.

(i) It involves thinking about the social consequences of the software you develop.
(ii) It prohibits the use of proprietary software for which you have not paid.
(iii) It implies not using a computer to steal information.

Which of the above statements is/are true ?

(a) Only (i)	(b) Only (ii)	(c) Only (i) and (iii)
(b) (d) Only (ii) and (iii)	(e) (i), (ii) and (iii)	

46) Identify the traditional, system development phases from among the following.

(a) System Documentation	(b) Scope Definition	(c) Project Management
(d) System implementation	(e) Requirement Analysis	

47) Which of the following is/are correct regarding Process modelling and DFD's?

(a) There is a standard symbol set for DFD's.
(b) An Elementary Process in a Data Flow Diagram is a process that cannot be decomposed further.
(c) Process modeling is a technique for organizing and documenting the structure and flow of data through a system's processes.
(d) A single DFD can include processes that happen hourly, daily, weekly or yearly.
(e) It is a graphical representation using a set of symbols and notations to describe a business's operations through data movement.

48) Consider the following statements.

(i) The Gantt chart is a popular tool that supports project management.
(ii) Project Management tools have facilities to monitor the progress against schedule and budget.
(iii) Project management is to plan and manage a project to successfully complete its listed goals and deliverables.

Which of the above statements related to project management is/are correct?

(a) Only (i)	(b) Only (i) and (ii)	(c) Only (ii) and (iii)
(d) Only (i) and (iii)	(e) (i), (ii) and (iii)	

49) Consider the following statements related to automated tools and technology.

    (i)   An integrated development environment (IDE) is a software application that provides comprehensive facilities to computer programmers for software development

    (ii) JIRA is proprietary software, which provides bug tracking, issue tracking, and project management functions.

    (iii) Real CASE tools can be broadly divided into three categories based on their use at a particular SDLC stage as upper case tools, lower case tools and integrated case tools.

Which of the above statements is/are correct?

(a) Only (i)
(b) Only (ii)
(c) Only (i) and (ii)
(d) Only (ii) and (iii)
(e) (i), (ii) and (iii)

50) Consider the following statements related to CASE tools.

    (i) Reverse engineering is a CASE tool capability that can automatically generate initial system models from software or database code

    (ii) CASE tools help systems analysts to automate some of the system modeling tasks.

    (iii) Project Managers use PERT charts in CASE tools to show the interdependencies between a project's tasks.

Which of the above statements is/are correct?

(a) Only (i)
(b) Only (ii)
(c) Only (iii)
(d) Only (i) and (iii)
(e) (i), (ii) and (iii)

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