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 R1

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.**
-

1) Which of the following are types of information systems that use databases of expert knowledge to offer advice or make decisions in such areas as medical diagnosis.

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

2) What is the best way of filling the blanks in the following incomplete sentence?
…… is a specialist who develops a comprehensive plan and instructions which can be given to the programmers

(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) Database programmers are responsible for maintaining and updating computer programs and databases, and writing new code as required.
(b) Web architect is a specialist who designs complex web sites, social media applications for organizations and private business.
(c) System programmers are specialists who converts business requirements and statements of problems and procedures into computer languages.
(d) Quality Assurance Engineer is responsible for creating detailed, comprehensive and well-structured test plans & test cases, estimating, prioritizing, planning and coordinating quality testing activities
(e) A webmaster is someone who creates and manages the content and organization of a website, manages the computer server and technical programming aspects of a website or does both.

4) Consider the following skills.
(i) Working knowledge of information technologies
(ii) Good written and verbal communication skills
(iii) Good interpersonal skills

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) Each of the blanks labeled A – E of the paragraph given below has to be filled with the most appropriate word selected from the phrases labeled (i) – (vi).

(i). Information system

(ii). Waterfall development approach

(iii). System development life cycle

(iv). Iterative development approach

(v). Systems Analysis and Design

(vi). Incremental development

The …..A……. is a term used in systems engineering, information systems and software engineering to describe a process for planning, creating, testing, and deploying a/an ……..B…….. The …….C…….. is an approach to …….D…….. that completes each phase one after the other and only once. It has lost favor with most modern system developers. ……E……. is a way of breaking down the software development of a large application into smaller chunks and complete the entire information system in successive iterations.

Which of the following gives the most appropriate labels for A, B, C, D and E?

(a) A – (ii), B – (i), C – (iii), D – (vi), E – (iv)
(b) A – (iii), B – (ii), C – (i), D – (iv), E – (v)
(c) A – (v), B – (ii), C – (iv), D – (i), E – (vi)
(d) A – (iii), B – (i), C – (ii), D – (v), E – (vi)
(e) A – (iii), B – (i), C – (ii), D – (v), E – (iv)

6) Which of the following is/are true regarding the Scope Definition phase of the Software Development Life Cycle?

(a) It is the initial step in the project development process.
(b) During this phase it establishes the project plan in terms of scale, development strategy, schedule, resource requirements and budget.
(c) Candidate solutions are identified and analyzed during this stage.
(d) A class model needs to be drawn during this phase.
(e) It answers the question "Is this project worth looking at?".

7) Consider the following tasks in relating to the tasks of a software developer.

(i) Writing and implementing efficient code
(ii) Maintaining and upgrading existing systems
(iii) Drawing a Use Case model for the identified candidate solution.

Which of the above is/are typical task(s) of the Design phase?

(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 cost more than the estimated cost.
(ii) The system may be delivered later than planned.
(iii) The system will become unreliable and prone to errors.

(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) Requirements about resources required, response time and transaction rates.
(ii) Requirements about the accuracy and precision of the data.
(iii) Every order shall be allocated a unique identifier.

Which of the following 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 with the appropriate choice.

..... phase in the system development life cycle defines business requirements for the 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 Requirements Analysis Phase?

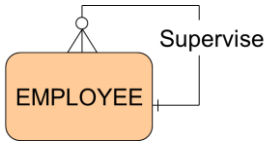
(a) This phase answers the question "What do the users need and want from a new system?"
(b) Updating and refining the project plan would not be a part of this phase.
(c) During this phase all the Databases are created.
(d) The purpose of this phase is to determine the worthiness of the project and to create a plan to complete it.
(e) After the project team receives all of the customer requirements or specifications, the team begins to analyze each requirement.

12) Some questions related to Data Modeling with possible answers are given below.
(i) Q. Is the following statement correct?
"In a Library system, *Book*, *Member* and *Lending_Details* are entities"
A. Yes
(ii) Q. What is Data Modeling?
A. It is a technique for organizing and documenting a system's processes.
(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 the corresponding statements.



(i) The degree of the above relationship is 1.
(ii) It is an example for a recursive relationship.
(iii) *Supervise* is the relationship name.

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) Physical process models show what the system is or does.
(ii) Process models are always implementation dependent.
(iii) Logical 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 (i) and (ii)
(d) Only (ii) and (iii)
(e) (i), (ii) and (iii)

15) Fill in the blank space with the appropriate choice.

……. is a file or repository that hold information for later use, such as a database table or a membership form.

(a) primitive process
(b) external agent
(c) data store
(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 cannot be decomposed further.
(ii) Q. What is the symbol used to represent a Data store in any methodology?
A. It is a rounded rectangle.
(iii) Q. Is the following statement correct?
"Data stores will not be directly linked to each other by data-flows; information is transformed from one stored state 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 (i) and (iii)
(e) (i), (ii) and (iii)

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

(a) Context Data flow diagrams are used to define system boundaries.
(b) Data modeling is often the first step in database design as the designers first create a conceptual model of how data items relate to each other.
(c) Further analysis of Data flow diagrams creates Context Data flow diagrams.
(d) Data flows in a DFD represents an input of data to a process or the output of data from a process.
(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 does the number of entities that participate in a relationship called?
A. Cardinality

(ii) Q. What is the candidate key that will most commonly be used to uniquely identify a single entity instance called?
A. A Concatenate key

(iii) Q. Is the following statement correct?
"Relationships may also exist between different instances of the same entity."
A. Yes

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) …… defines the possible number of occurrences in one entity which is associated with the number of occurrences in another.

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

20) ……. is an approach that seeks to discover and exploit the commonalities between entities.

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

21) ……. is a definable thing or concept within a system, such as a person/role (e.g. Student), object (e.g. Invoice), concept (e.g. Profile) or an event (e.g. Transaction).

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

22) …….. is the concept of generalization in data models that permits us to reduce number of attributes through the careful sharing of common attributes.

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

23) When designing a Data Model for *Car* you can have a ..... entity of *Car as Vehicle* and its child entitiy can be *RacingCar*.

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

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

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

25) Consider the following statements.

i. Several processes in a DFD might be executing or working simultaneously.
ii. System models and prototypes should be validated for completeness and correctness.
iii. DFD is a diagram that represents non-technical details in a system.

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 relationships.

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

27) Which of the following is/are principles that should underlie all system development methodologies?

(a) Get the system users involved.
(b) Establish standards.
(c) Design system for growth and change.
(d) Do not be afraid to cancel or revise scope.
(e) Should not justify information systems in terms of capital investment.

The blanks in Questions 28 – 34 have to be filled by selecting the most appropriate words/phrases from the list labelled (i) – (vii). Note that one word/phrase may be used in more than one instance.

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

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

28) ……. is usually defined as a mechanism by which more specific classes incorporate structure and behavior of more general classes.

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

29) For a given base class *Vehicle* …… enables the programmer to define different methods with the same name for any number of derived classes such as Cars, Trucks, Three Wheelers etc.

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

30) …….. permits 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 a type of static structure diagram that describes the structure of a system.

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

33) …… is a technique wherein the attributes and behaviors that are common to several types of object classes are grouped into their own class.

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

34) In UML, …….. provides a snapshot of the instances in a system and the relationships between the instances.

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

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

(a) Video conferencing facility permits the systems analyst to interview clients who are at distant locations.
(b) Interviews allow the systems analyst to probe for more feedback from the interviewee.
(c) Interviews are very time consuming, and therefore a costly approach.
(d) Interviews do not permit the systems analyst to reword questions for each individual.
(e) A structured interview is an interview in which the interviewer has no specific set of questions to ask from the interviewee.

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

(i) Operational Feasibility
(ii) Candidate Systems Matrix
(iii) Technical Feasibility
(iv) Schedule Feasibility
(v) ROI Analysis
(vi) Payback Analysis
(vii) Feasibility Analysis Matrix
(viii) Feasibility Analysis

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

36) …….. is a technique that compares the lifetime profitability of alternative solutions.

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

37) …….. is a mathematical methodology to determine the payback period for an investment. The payback period is how long it will take to pay off the investment with the cash flow derived from the asset or project.

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

38) …… helps organizations determine whether the technical resources meet capacity and whether the technical team is capable of converting the ideas into working systems.

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

39) ……. is a tool used to document similarities and differences among candidate systems.

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

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

(a) *Political feasibility* deals with how the end users feel about the proposed system.
(b) *Cultural 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* addresses the following issue.
"Which end users or managers resist using the system and whether this can be overcome?
(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) Feasibility of a project cannot be changed during system development.

41) Which of the following statements is/are true regarding systems design?

(a) RAD (Rapid Application Development) is a system design approach that utilizes structured prototyping and Joint Application Development techniques to quickly develop systems.
(b) Prototyping is an experimental process where design teams implement ideas into tangible forms from paper to digital.
(c) Prototyping approach is an iterative process involving close working relationship between the designer and the users.
(d) In Information systems design the tasks that focus on the specification of a detailed computer-based solution are defined.
(e) RAD is a technique that focuses on data and strategic planning to produce application projects.

42) The following statements are related to systems design. Identify the correct statements.

(a) Systems design is the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements. (b) Object-oriented design is the process of planning a system of interacting objects for the purpose of solving a software problem. (c) Modules in a system should be loosely cohesive. (d) Modules in a system should be tightly coupled. (e) Modules in a system should be minimally dependent on one another to minimize the effect that future changes in one module will have on other modules.

43) …… shows the decomposition of a problem and it is a tool to aid in software design. Select the appropriate choice to fill the blank from the word(s)/phrase(s) below.

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

44) Consider the following statements in relation to system design.

(i) The Physical data flow diagram is a process model used to communicate the technical implementation characteristics of an information systems.

(ii) OOD is used to refine the object requirements definitions identified earlier during analysis and to define design specific objects.

(iii) The prototype gives the customer a complete idea of how the site will look like at the end.

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) One should not use a computer to harm people.

(ii) One should not use proprietary software for which they have not paid.

(iii) One should not use a computer to steal.

Which of the above statements is/are true ?

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

46) Identify the traditional system development phases?

(a)	Project Management	(b)	Scope Definition	(c)	System Construction
(d)	Systems Design	(e)	Requirement Analysis		

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

(a) There are several competing symbol sets for DFD's.
(b) In a DFD, it is possible to represent several processes to operate in parallel, thus they may be working simultaneously.
(c) Process modelling is a technique for organizing and documenting the structure and flow of data through a system's processes and/or the procedures to be implemented by a system's processes.
(d) A single DFD cannot include processes that happen hourly, daily, weekly or annually
(e) A process in a Data flow diagram is represented by a circle.

48) Consider the following statements.

(i) PERT charts and Gantt charts are two popular tools that supports project management.
(ii) Project Management tools do not have facilities to monitor the progress against schedule and budget.
(iii) Project management is the process of scoping, planning, staffing, organizing, directing and controlling the development of an acceptable system at a minimum cost within a specified time frame.

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) CASE Tools provide automation and reduce the time to complete many tasks, especially those involving diagramming and associated specifications.
(ii) An integrated development environment (IDE) is a software application that provides comprehensive facilities to computer programmers for software development
(iii) The Visual Paradigm is an example of a Case tool.

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) Forward 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 Gantt 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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