UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)
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IT2405: Systems Analysis and Design
Multiple Choice Question Paper

27ᵗʰ July 2014

(TWO HOURS)

<u>**Important Instructions :**</u>

- The duration of the paper is 2 (two) hours.

- The medium of instruction and questions is English.

- The paper has **50 questions** and **13 pages**.

- All questions are of the MCQ (Multiple Choice Questions) type.

- All questions should be answered.

- Each question will have 5 (five) choices with <u>**one or more**</u> 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) The type of information system that captures and reproduces the knowledge of an expert problem solver or decision maker and then simulates the thinking of that expert using AI technology is known as a/an

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

2) Consider the following incomplete sentence.
………………… is a specialist who studies the problems and needs of an organization to determine how people, data, processes and information technology can best accomplish improvements for the business.
How should the above blank space be filled?

    (a) A system User
    (b) A system owner
    (c) A systems Analyst
    (d) An Executive
    (e) An Information worker

3) Which of the following activity/activities is/are carried out by a systems analyst?

    (a) Creating and using information
    (b) Developing, operating and maintaining the information system
    (c) Translates system users' business requirements and constraints into technical solutions
    (d) Requirement identification
    (e) Quality management

4) Consider the following skills of a Systems Analyst.
(i) Working knowledge of Information Technologies
(ii) Specialized knowledge of database languages and technology
(iii) General problem solving skills
Which of the above is/are skills needed by systems analysts?

    (a) Only (i)

    (b) Only (i) and (ii)

    (c) Only (ii) and (iii)

    (d) Only (iii)

    (e) Only (i) and (iii)

5) Each of the blanks labeled A – E of the paragraph given below has to be filled with the most appropriate phrase selected from the phrases labeled (i) – (v) as follows.

 (i) distributed system

 (ii) centralized system

(iii) personal computer

(iv) host computer

 (v) Network computing system

Today's information systems are no longer monolithic mainframe computer based systems. Instead they are built on some combination of networks to form a ………A………..

In …..B…… , a central multiuser computer hosts all components of an information system. The users interact with this host computer via terminals (or today, a …C…… emulating a terminal), but virtually all of the actual processing and work is done on the ….D….

A/An ……E………. is a multitiered solution in which the presentation and the presentation logic layers are implemented in client server web browsers.

Which of the following gives the most appropriate way of filling?

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

6) Which of the following is/are true regarding systems development?

(a) When using the waterfall development approach, system design will be started after the completion of the systems analysis phase.
(b) Systems development is a naturally sequential process, moving in a one-way direction from phase to phase.
(c) Waterfall approach has lost favour with most modern system developers.
(d) Waterfall development approach is also called incremental development process
(e) Iterative development approach does not encourage the project team to complete the development in successive iterations.

7) Consider the following activities in connection with software development.
   (i) Get the system users involved
   (ii) Establish phases and activities
   (iii) Document through the development

Which of the above is/are software development principles?

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

8) Consider the following statements with respect to system building.

(i) Quality with respect to a computer system means only an error-free system.
(ii) The linear or waterfall cycle is a development process that focusses on planned work and is best suited for projects where the requirements can be clearly defined.
(iii) If a project is too large, it is advisable to break it up into smaller stages and build the system with one stage at a time.

Identify the correct statement(s) from among them.

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

9) Which of the following is/are correct regarding Systems Development?

(a) Using standard methods help to reduce costs of training development staff.
(b) Extreme Programming is a system development methodology.
(c) Systems development methodology executes the system development stages of the system life cycle.
(d) Systems developing methodology and systems development life cycle are not the same.
(e) A system cannot be in more than one life-cycle stage at the same time.

10) Consider the following incomplete sentence.

.... phase in the system development life cycle sets project bounds which define what

part of the system can be changed by the project and what parts are to remain unchanged.
What is the best way to complete it?

(a) System specification	(b) Physical model	(c) System design
(d) System development	(e) Scope definition	

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

(a) This phase answers the question "Are the problems really worth solving?"
(b) Candidate solutions are analyzed during this phase.
(c) This phase answers the question "Is a new system really worth building?"
(d) The goal of the problem analysis phase is to study and understand the problem domain well enough to thoroughly analyze its problems, opportunities and constrains.
(e) It provides the analyst with more thorough understanding of the problems, opportunities and/or directives that triggered the project.

12) Some questions related to modeling with possible answers are given below.
   (i) Q. Are there several notations for ERDs?
       A. Yes.
   (ii) Q. What is an Entity in Data Modeling?
       A. It is something about which the business needs to store data.
   (iii) Q. Is the following statement correct?
       "Data type in Data Modeling is a property of an attribute that defines what values the
       attribute can legitimately take on. "
       A. Yes

   Which of the above pairs is/are correct?

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

13) Which of the following is/are correct regarding modelling?

   (a) Models can be built for existing systems as a way to better understand those systems or for
       proposed systems as a way to document business requirements.
   (b) An external agent defines a person, an organization unit, another system or another
       organization that lies outside the scope of the project but interacts with the system being
       studied.
   (c) A physical model is a non-technical pictorial representation that shows what a system is or
       does.
   (d) Systems analysts use physical system models to show business requirements and logical
       system models to show technical designs.
   (e) A data store in a Data flow diagram is represented by a square.

14) Consider the following statements related to Data stores in a DFD.
   (i) If data flows are data in motion, think of Data stores as data at rest.
   (ii) Member and Book are possible Data stores in library systems.
   (iii) DeMarco/Yourdon Symbol for Data store is given below.

   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) All

15) Consider the following incomplete question.
   Which of the following Demarco/Yourdon symbol is used to represent …………. in a DFD?

   What is the best way of completing it?
   (a) Primitive processes
   (b) External Agents
   (c) Data Stores
   (d) Data flows
   (e) Processes

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 which cannot be decomposed further.
   (ii) Q. What is the symbol used to represent a Process?
       A. It is a rounded rectangle.
   (iii) Q. Is it illegal to have a Data store directly connected to a External Entity in a DFD?
       A. Yes. A Process is needed to update (or use) a Data Store.

   Which of the above pairs is/are correct?

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

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

(a)	Process modeling is a technique used for defining business requirements for a database.
(b)	Data modeling is sometimes called database modeling because a data model is eventually implemented as a database.
(c)	Entity in an ERD is represented by a rectangle in Martin notation.
(d)	Domain is a descriptive property or characteristics of an Entity.
(e)	DFD is a Process model.

18) Some questions related to entity modeling with possible answers are given below.

   (i) Q. What is a degree?
       A. It is the number of entities that participate in a relationship.
   (ii) Q. What is a relationship?
       A. It is a natural business association between two entities.
   (iii) Q. What is cardinality?
       A. It is the minimum and maximum number of occurrences of one entity that may be related to a single occurrence of the other entity.

   Which of the above pairs is/are correct?

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

The blanks in the Questions 19-24 have to be filled by selecting the most appropriate words/phrases from the list labelled (i) – (vi).

   (i) Composite data flow
   (ii) Data flow
   (iii) Primitive process
   (iv) Recursive Relationship
   (v) Degree
   (vi) Generalization

What is the most appropriate way to fill in the given blanks in each of the following sentences?

19) ……………. is a relationship that exists between instances of the same entity.

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

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20) …………... is a concept wherein the attributes that are common to several types of an entity are grouped into their own entity.

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

21) A ………………. is used to represent the creation, reading, deletion or updating of data in a file ata store in a DFD.

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

22) If two different entities participate in a relationship the …… of the relationship is two.

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

23) .... is the lowest level detail shown in a process model.

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

24) ………… is a data flow that consists of other data flows.

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

25) Given below are some statements associated with decision tables used for process description. Identify the correct statement(s) from them.

(a) Decision tables can be used when the specified process selects one of the possible sets of actions using a set of complex rules.

(b) Decision tables are divided into two parts, the conditions and actions.

(c) A single column of a decision table corresponds to one condition combination.

(d) A single column of a decision table corresponds to one action.

(e) A Decision table cannot be used to describe an elementary process.

26) Consider the following statements related to process modeling.
   (i) Phisical models are implementation dependent because they reflect technology choices and the limitations of those technology choices.
   (ii) Phisical models allow us to communicate with end users in nontechnical or less technical languages.
   (iii) Processes on a Data flow diagram can operate in parallel whereas processes on flow charts can execute only one at a time.

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) All	

27) A Phrase from Column **A** has to be matched with the most appropriate phrase from Column **B**.

	Column A		Column B
(i)	Functional Decomposition Diagram	A	is a diagram that shows only the system's main interfaces with its environment.
(ii)	Context Data Flow Diagram	B	is drawn to partition the system into logical subdivisions and/or functions.
(iii)	Generalization /Specialization	C	provides the developer with a snapshot of the system's object at one point in time.
(iv)	Object Diagram	D	shows the systems object structure.
(v)	Class Diagram	E	is an approach that seeks to discover and exploit the commonalities between object classes.

The correct matching is

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

The blanks in the Questions 28 – 33 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) Component diagram
        (ii) Deployment machine
        (iii) Activity diagram
        (iv) Polymorphism
        (v) Inheritance
        (vi) Composition
        (vii) Override

What is the most appropriate way of filling the blank in each of the following cases?

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

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

29) ……………… shows the organization of program code divided into components and how the components interact.

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

30) ……………….. shows the configuration of software components within the physical architecture of system's hardware "nodes".

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

31) ………………. . literally meaning "many forms", the concept that different objects can respond to the same message in different ways.

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

32) …………… shows the sequential flow of activities of a use case or business process. It can also be used to model logic with the system.

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

33) ……………… is an aggregation relationship in which the "whole" is responsible for the creation and destruction of its "parts". If the "whole" were to die, the "part" would die with it.

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

34) Consider the following statements in relation to using questionnaires as a requirements discovery method.

    (i)   Good questionnaires are very difficult to prepare.

    (ii) A disadvantage is that there is no guarantee that an individual will answer or expand on all of the questions in a questionnaire.

    (iii) There is no immediate opportunity to clarify a vague or incomplete answer to any question in the questionnaire.

Which of the above statements is/are correct?

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

35) Which of the following is/are correct regarding Requirement Analysis?

(a) System requirements that specify a property or quality which the system must have are frequently referred to as nonfunctional requirements.
(b) System requirements that specify what information systems must do are frequently referred to as functional requirements.
(c) During this phase, the analyst does not approach programmers to find out what they need or want out of the new system
(d) Requirement definition document is a formal document that communicates the requirements of a proposed system to key stakeholders.
(e) Requirement definition document serves as a contract for the systems project.

Questions (36) and (40) are related to the following feasibility tests.

    (i) Operational
    (ii) Political
    (iii) Technical
    (iv) Schedule
    (v) Economic
    (vi) Legal

What is the best way using above to fill each of the following blanks?

36)

.... feasibility is another name given to Cultural Feasibility.

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

37) ………………….. feasibility asks if, given what is known about the problem and the cost of the solution, the problem is still worth solving.

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

38)

……………. feasibility addresses the following issue.

"How do the end users feel about their role in the new system?

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

39) …………. feasibility has been defined as a cost benefit analysis.

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

40)

……………. feasibility addresses the following issue.

"Given the available technical expertise, are the project deadlines reasonable?"

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

41) Which of the following statement(s) describe(s) the disadvantages of observing the work environment?

    (a) People may unwittingly perform differently when being observed.
    (b) Some systems activities may take place at odd times, causing scheduling inconvenience for the systems analysts.
    (c) Observation is relatively expensive compared with interviews.
    (d) It does not let the systems analyst to do work measurements.
    (e) An analyst cannot obtain data describing the physical environment of the task.

42) The following statements are related to fact finding techniques. Identify the correct statements.

(a) Questionnaires are highly recommended for a situation where opinions of the employees of a large organization are needed
(b) Prototyping creates a culture where only the analyst and designer play the leading role.
(c) The three types of questionnaires are Free-format, Fixed-format and Ranking-format.
(d) Leading questions should be avoided during an interview.
(e) Prototyping creates a culture of democracy by involving users in the development.

43) Conducting surveys through questionnaires is a fact finding technique. Which of the following is a/are disadvantage(s) of the above method?

(a) Most questionnaires cannot be answered quickly.
(b) It is a relatively expensive means of gathering data from a large number of individuals.
(c) It does not allow an individual to maintain anonymity.
(d) There is no guarantee that an individual will answer or expand on all of the questions.
(e) Responses cannot be tabulated or analyzed quickly.

44) Consider the following statements related to Interviews.
(i) Success of the interview does not depend on the human relations skills of the systems analyst.
(ii) It allows the systems analyst to probe for more feedback from the interviewee.
(iii) They are very time consuming and therefore are costly approaches.

Which of the above is a/ are disadvantage(s) of using interviews as a fact gathering technique?

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

45) Which of the following statements is/are correct regarding systems design?

(a) Systems Design focuses on the technical concerns of the system.
(b) Structured design seeks to factor a program into the top-down hierarchy of modules that have high cohesion and loose coupling.
(c) A Physical Data Flow Diagram (DFD) is a process data model used to communicate the technical implementation characteristics of an information system.
(d) An Object Oriented design encourages separation of concerns about data and processes.
(e) During prototyping, the scope and complexity of the system can quickly expand beyond the original plan and can easily get out of control.

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46) Consider following statements related to system design.

    (i) An application architecture defines the technologies to be used by information systems in terms of their data , processes, interfaces and network components.

    (ii) Rapid Application Development is a systems design approach that utilizes structured prototyping and JAD techniques to quickly develop systems.

    (iii) System design tasks for in-house development can be categorized as follows:
Design the application architecture, Design the system databases, Design the system interface, Package design specifications and Update the project plan

    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) All

47) Which of the following is/are correct regarding application architecture and modeling?

(a) A physical process is either a processor, such as a computer or a person or technical implementation of specific work to be performed such as a computer program or a manual process.

(b) Each logical process must be implemented as two or more physical processes.

(c) Physical Data flow diagrams show different implementations of a logical process as two or more physical processes.

(d) New processes are added to Physical Data flow diagrams to show the implementation of security requirements and audit trails.

(e) External agents and Data stores are carried over from the logical Data flow diagram to Physical Data flow diagram unchanged.

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

    (i) CASE tools only help systems analysts to automate the system design tasks.

    (ii) Integrated Development Environment(IDE) is an integrated software development tool that provides all the facilities necessary to develop new application software with maximum speed and quality.

    (iii) Process manager application tools and project manager application tools are intended to support cross life-cycle activities.

    Which of the above statements is/are correct?

(a) Only (i)

(b) Only (i) and (ii)

(c) Only (ii) and (iii)

(d) Only (i) and (iii)

(e) All

49)   Consider the following tools.

                  (i)   Borland's J Builder
                  (ii)   Rational Rose
                  (iii) IBM's Websphere

Which of the above falls into Integrated Development Environments?

     (a)   Only (i)

     (b)   Only (ii)

     (c)   Only (i) and (ii)

     (d)   Only (i) and (iii)

     (e)   None of the above

50)   Consider the following statements related to Project Managers.

(i) Successful Project Managers possess a wide range of technical , management, leadership, and communication skills.

(ii) Good project managers possess business achievement competencies such as business awareness, business partner orientation and commitment to quality.

(iii) The following self-management competencies are some of the competencies a project manager should possess.

Self-confidence, Stress management

Which of the above is/are correct?

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

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