UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY
Academic Year 2009/2010 – 1st Year Examination – Semester 2

IT2404: Systems Analysis and Design
Multiple Choice Question Paper

8th August 2010
(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 **14 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

1) Information Systems can be classified according to the functions they serve. Which of the following is are correct?

> (a) Transaction processing systems process business transactions such as orders, payments and reservations
>
> (b) Management information systems use the transaction data to produce information needed by managers to run the business.
>
> (c) Decision support systems capture and reproduce the knowledge of an expert problem solver or decision maker and simulates the thinking of that expert.
>
> (d) Communication and collaboration systems enhance communication and collaboration between people, both internal and external to the organization.
>
> (e) Executive information systems help employees create and share documents that supports day-to-day office activities.

2) A feasibility study is carried out

> (a) before commencing the system development.
> (b) once the system is analyzed and designed.
> (c) throughout the system development life cycle
> (d) to measure how beneficial or practical an information system will be to an organization.
> (e) to tell the organization's managers how the system will function.

3) Identify the possible values and benefits of Information Systems.

> (a) Reduce Business Costs
> (b) Increase Efficiency
> (c) Improve Decision Making
> (d) Better Compliance with Regulations
> (e) Fewer Mistakes

4) Stakeholders for Information Systems can be broadly classified into five groups. Identify the correct classification.

> (a) System Users, System Owners, System Operators, Systems Analysts , and System Builders
>
> (b) System Users, System Programmers, System Operators, Systems Analysts , and System Builders
>
> (c) System Users, System Owners, System Operators, Systems Analysts , and System Programmers
>
> (d) System Users, System Designers, System Operators, Systems Analysts , and System Builders
>
> (e) System Users, System Owners, System Designers, Systems Analysts , and System Builders

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

   (i)   objects
   (ii)   data
   (iii)   behaviour
   (iv)   attributes
   (v)   an object
   (vi)   a state

Systems consists of ………**A**………., where a/an ……..**B**……… is something that is or is capable of being seen, touched, or otherwise sensed and about which users store ….**C**…….. and associate ………**D**………The data or ……..**E**……. , represent characteristics of interest about an object.

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

6) Which of the following is/are traditional, basic system development phases?

(a) Project Management	(b) Systems Analysis	(c) System Implementation
(d) Process Management	(e) Systems Design	

7) In addition to having formal systems analysis and design skills, a systems analyst must develop or possess other skills, knowledge and traits to complete the job.

Which of the following is /are considered as such skills, knowledge and traits ?

   (a) Working knowledge of information technologies
   (b) Computer programming experience and expertise
   (c) General knowledge of business processes and terminology
   (d) General problem solving skills
   (e) Systems programming skills

8) A non technical pictorial representation that shows what a system is or does is known as a

(a) physical model	(b) implementation model	(c) logical model
(d) business model	(e) data flow model	

9) A model that shows not only what a system is or does but also how a system is physically and technically implemented is called a

(a) logical model	(b) physical model	(c) conceptual model
(d) business model	(e) technical model	

10) | Which of the following is/are correct regarding the data flow diagrams (DFD)?

> (a) It is a diagram that represents non technical details in a system.
> (b) Several processes in a DFD might be executing or working simultaneously.
> (c) DFDs show the flow of data through the system.
> (d) The arrows in a DFD represent pointers to the next process or operation in an algorithm which may include looping and branching.
> (e) Processes on a DFD can execute only one at a time.

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

> (i) Q. Are there a standard set of symbols used for drawing DFDs?
>   A. No. There are several competing symbol sets.
> (ii) Q. How many symbols used in DFDs?
>   A. There are only three symbols and one connection.
> (iii) Q. What is an external agent?
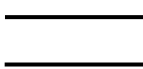>   A. It defines a person, organization unit, system, or an organization that interact with a system.

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

12) | Which of the following is/are correct regarding the data flow diagrams (DFD)?

> (a) An external agent can be a an office, department, division or individual within your company that provides net inputs to the system, receives net outputs from that system, or both.
> (b) An external agent is a another business or information system that is separate from your system but with which your system must interface.
> (c) Data store is another name given for the External agent.
> (d) External Agent should be named with descriptive, singular nouns such as Registrar, Supplier or Financial Information System.
> (e) It is not permitted to duplicate external agents on DFDs.

13) | Which of the following is/are correct regarding the data flow diagrams (DFD)?

> (a) Data stores in a DFD represent stored data intended for later use.
> (b) Gane and Sarson symbol for a data store is given below.
>
>
>
> (c) A process in a DFD represents the work performed by a system in response to incoming data flows.
> (d) Decomposition is the act of breaking a system into its component sub systems, processes, and subprocesses.
> (e) Logical processes are work or actions that must be performed no matter how you implement the system.

14) …………… are the lowest level of details shown in a process model.

(a) Primitive processes	(b) Elementary processes	(c) Data stores
(d) External entities	(e) Logical Processes	

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

(i) Q. What is a context data flow diagram?
A. It is a one page data flow diagram constructed to establish initial project scope and shows only the systems main interfaces with its environment.
(ii) Q. What is the symbol used in Gane and Sarson notation to represent a process?
A. Square
(iii) Q. Is it illegal to have two data stores directly connected in a DFD?
A. Yes. A process is needed to move data from one data store to another

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

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

(a) Data modeling is a technique for organizing and documenting a systems data.
(b) Data modeling is some times called database modeling because a data model is eventually implemented as a database.
(c) Entity relationship diagram is a process model utilizing several notations to show data and processes.
(d) Attribute is a class of persons , places, objects, events, or concepts about which we need to capture and store data.
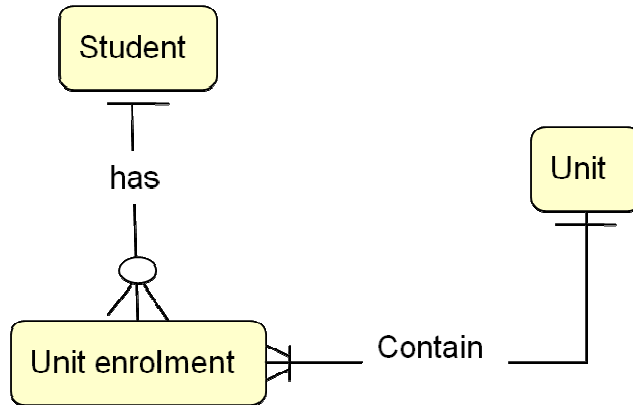(e) Data type is a descriptive property of an entity.

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

(i) Q. What is a foreign key?
A. It is primary key of an entity that is used in another entity to identify instances of a relationship.
(ii) Q. What is the name given for a relationship that exists between different instances of the same entity?
A. Associate relationship
(iii) Q. Degree is a measure of complexity of a data relationship. What is the degree of a recursive relationship?
A. Two

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	

18) Consider the following diagram.

Which of the following statement(s) is / are true regarding the above Diagram?

(a) The degree of the relationship between Student and Unit enrolment is 2.
(b) The cardinality interpretation of the Student end of the Student – Unit enrolment relationship is zero or more.
(c) The cardinality interpretation of the Unit enrolment end of the Student – Unit enrolment relationship is zero or more.
(d) The cardinality interpretation of the Unit enrolment end of the Student – Unit enrolment relationship is zero, one or more.
(e) The cardinality interpretation of the Unit enrolment end of the Unit – Unit enrolment relationship is one or more.

19) Which of the following statements is/are correct regarding process modeling?

(a) Functional Decomposition Diagrams provide us with a beginning of an outline to draw a Data Flow Diagram (DFD).
(b) An elementary process in a DFD cannot be decomposed further.
(c) Decision table is used to describe an elementary process in a DFD.
(d) Decision table is tabular form of presentation that specifies a set of conditions and their corresponding actions.
(e) Complex elementary processes can be best described using structured English.

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

	Column A		Column B
(i)	Encapsulation	A	An aggregation relationship in which the 'whole' is responsible the creation and destruction of its parts.
(ii)	Aggregation	B	A relationship in which one larger "whole" class contains one or more smaller 'parts' classes.
(iii)	Composition	C	the packaging of several items together into one unit.
(iv)	Multiplicity	D	The concept that different objects can respond to the same message in different ways.
(v)	Polymorphism	E	The minimum and maximum number of occurrences of the related object class.

The correct matching is

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

The blanks in the Questions 21 – 25 have to be filled by selecting the most appropriate words/phrases from the list labelled (i) – (v). Note that one word/phrase may be used in more than one instance.

> (i) Sequence Diagram
> (ii) Object Diagram
> (iii) State Diagram
> (iv) Activity Diagram
> (v) Deployment diagram

What is the most appropriate way of filling the blanks?

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

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

22) ……………… shows the sequential flow of activities of a use case or business process.

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

23) ……………….. models actual object instances with current attribute values.

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

24) ……………… . shows how objects interact with each other via messages in the execution of a use case or operation.

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

25) …………… models how events can change the state of an object over its lifetime, showing both the various states that an object can assume and the transitions between those states.

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

26) Each of the blanks labelled **A – F** of the paragraph given below has to be filled with the most appropriate word selected from the phrases labelled (i) – (v). Note that one word or phrase might be used more than once.

> (i). Modern structured design
> (ii). a data model diagram
> (iii). Rapid application development
> (iv). Information engineering
> (v). Prototyping

…**A**…… is a systems design technique that decomposes the system's processes into manageable components. …**B**… is a data centered, but process-sensitive technique for planning, analyzing and designing information systems. Its primary tool is ……**C**……… Today many analysts and designers prefer …**D**……, a modern engineering-based approach to design. It is an iterative process involving a close working relationship between the designer and the user. ……**E**…….. is a systems design approach that utilizes structured, …**F**……. and Joint Application Development technique to quickly develop systems.

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

27) Which of the following is/are correct regarding physical Data Flow Diagrams (DFD)?

(a) Logical processes are frequently assigned to specific physical processes such as PCs , servers, people or other devices in a computer network.
(b) Physical data flow diagrams is a process model used to communicate the non technical implementation characteristics of an information system.
(c) A physical process is either a processor such as a computer or person or the technical implementation of specific work to be performed, such as a computer program or manual process.
(d) Each logical process must be implemented as one physical process.
(e) External agents are carried over from the logical DFD to the physical DFD unchanged.

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

(a) Both technical and non-technical people who have an interest in the proposed information system are known as stakeholders.
(b) A system analyst must develop computer programming experience and expertise in order to prepare an adequate business and technical specification for a system.
(c) A Web master is a person who is specialized in coding and maintaining a web server.
(d) A system designer is a stakeholder who is solely responsible for studying the problems and needs of an organization.
(e) A Systems analyst is a unique stakeholder who facilitates the development of an information system through interaction with the other stakeholders.

Questions (29) and (30) are based on the following systems architectures.
(i)   File Server Architecture
(ii)   Client/Server Architecture
(iii)   Internet-based Architecture

29) ……………………………… is / are example(s) for distributed systems.

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

30) In ……………………………………. the server computer hosts only the data layer and all other layers implemented on the client PC.

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

31) Consider the following statements.

(i) Spiral software development is an example for the iterative software development approach.
(ii) Waterfall development approach allows end-users / customers to experience as to how they will use the new software before the system is fully implemented and put into use.
(iii) Incremental software development approach does not reduce the overall risk of project failure.

Which of the above statements is / are correct regarding software development approaches?

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

32) Which of the following statements is /are correct regarding systems development?

  (a) Good communication between constantly changing stakeholders can be promoted by maintaining good documentation throughout the systems development.
  (b) The number and scope of phases and activities of a software development project do not vary with one project to another.
  (c) By using standards throughout the systems development, systems integration and organization can be enhanced.
  (d) Even without having a sufficient project budget and schedule to cover all project objectives, it is not advisable to reduce the scope of the project.
  (e) The systems should be designed to accommodate both growth and changing requirements.

33) Consider the following statements.

  (i) Rational Rose is a tool which assists analysts and designers to build information systems.
  (ii) A Methodology is the process of building and maintaining a system to ensure that systems are built in the most effective way.
  (iii) Tools will support methodologies and will replace systems analysts.

Which of the above is / are correct regarding systems development?

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

34) Scope definition is the preliminary investigation phase of the systems development process which

  (a) assess each problem and opportunity with respect to urgency and visibility.
  (b) establishes an initial baseline of the problems and opportunities.
  (c) should take more time in the systems development process.
  (d) may later change during the development life cycle.
  (e) involves drawing the data flow diagram for the given problem.

35) Which of the following is/are correct regarding automated tools or technology?

  (a) Automated tools improve the quality of the software being developed, because they check for completeness, consistency and contradictions.
  (b) Any computer application assistant will be able to use these tools.
  (c) Sybase's Powerbuilder is a CASE tool.
  (d) Life time maintenance cannot be reduced by using an automated tools.
  (e) They improve the productivity through automation of tasks.

36) Consider the following statements related to Automated tools.

 (i) Documentation tools are used to assemble, organize and report on system models, descriptions and specifications and prototypes.
 (ii) A CASE tools capability that can automatically generate initial system models from software or database code is called forward engineering.
 (iii) A CASE tools capability that can generate initial software or database code directly from system models is called reverse engineering.

Which of the above is / are correct?

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

37) Which of the options is/are appropriate to fill the following blank space?
……………………………………………………. is an/ are example(s) for Application Development Environment(s).

(a) Niku's Open Workbench	(b) Oracles's Developer	(c) Microsoft Project
(d) Microsoft Visio	(e) Borland's J Builder	

38) Which of the following statements is/are correct regarding Project Management?

(a) Macromedia's Cold Fusion is a Project Management tool.
(b) Pert chart is a commonly used project scheduling and progress evaluation tool.
(c) Gantt charts offer the advantage of clearly showing overlapping tasks that can be performed at the same time.
(d) Project Evaluation and Review Technique is a graphical network model that shows a project's tasks and the relationships between those tasks.
(e) The Project Manager is the person responsible for supervising a systems project from initiation to conclusion.

39) Which of the following statements is/are true with regard to feasibility analysis?

(a) Feasibility is the measure of how beneficial or practical the development of an Information System will be to an organization.
(b) Feasibility is only measured at the beginning of the Software Development Life Cycle.
(c) If a project is not feasible, then Management must cancel the project.
(d) Feasibility analysis plays a major role in the Decision Analysis phase in System Design.
(e) An objective of the feasibility study is to assess the performance of the development team.

40) Map the Information System Projects in Column X with the most crucial feasibility test in Column Y in the given situation.

Column X : Project	Column Y : Feasibility Test
1. Automated Robot controlled Operation for a highly profitable hospital	A. Economic Feasibility
2. An inventory management system for a medium size super market	B. Technical Feasibility
3. An aircraft simulation system for NASA	C. Operational Feasibility
4. A mobile phone based Agricultural Assistant System for farmers	D. Schedule Feasibility
5. A system to meet new government reporting regulations	E. Cultural Feasibility

Correct matching is:

(a) 1&C, 2&A, 3&B,4&E, 5&D
(b) 1&B, 2&E, 3&A,4&C, 5&D
(c) 1&A, 2&D, 3&B,4&E, 5&C
(d) 1&E, 2&B, 3&C,4&A, 5&D
(e) 1&D, 2&C, 3&E,4&B, 5&A

41) Cost Benefit Analysis is used to measure economic feasibility. Which of the following statements is/are true regarding Cost Benefit Analysis?

(a) Fixed Costs such as costs of computer usage, supplies and variable costs such as license payments, and employee wages are used to analyze the cost of the project.
(b) Fewer processing errors, increased throughput and decrease response time can be classified as intangible benefits.
(c) Payback analysis is a technique for determining if and when an investment will pay for itself.
(d) Return on investment analysis is used to calculate the current value of a unit of money.
(e) Net Present value is an analysis technique that compares the annual discounted costs and benefits of alternative solutions.

42) Which of the following statements is/are true regarding Feasibility Analysis?

(a) Candidate systems matrix is used to analyze the similarities and differences between candidate systems.
(b) Existing system is always included in the matrix as the baseline for comparing alternatives.
(c) Feasibility analysis matrix is a tool used to rank candidate systems.
(d) Feasibility study report should not recommend a solution to the management but leave the decision to the management.
(e) Candidate system matrix is a tool used to document the similarities and differences between candidate systems.

43) Correctly identifying system requirements is a must for smooth function of the development process. What is the /are the advantage(s) it gives?

> (a) Can reduce the cost of the system than projected
> (b) Can deliver the system on time
> (c) Performance of the system can increase much higher than projected
> (d) Requirements can be verified easily in the testing phase
> (e) The cost of maintaining and enhancing the system may be excessively high

44) Which of the following is/are non functional requirement type(s) defined in the PIECES classification of system requirements?

> (a) Performance
> (b) Interoperability
> (c) Effectiveness
> (d) Control
> (e) Safety

45) Which of the following statements is/are true as regards to functional and non functional requirements?

> (a) Requirements that specify a property or quality are referred to as functional requirements
> (b) Accessibility is a non functional requirement.
> (c) Non functional requirements are easy to quantify where as functional requirements are difficult.
> (d) Functional requirements depend on the expected users.
> (e) Facility to reserve a library item online in a library system is a functional requirement.

46) What are the advantages of an Interview as a fact finding technique?

> (a) Opportunity to motivate the interviewee to respond freely and openly
> (b) Less time consuming and cost effective
> (c) Loaded questions can be used to get the personal opinion of the interviewee
> (d) Can be used to evaluate and criticize the requirements
> (e) System analyst can adapt or reword questions for each interviewee

47) Map the statements in Column A with the fact finding techniques in the column B.

Column A	Column B
(i) Responses can be tabulated and analyzed quickly	A Sampling existing documents, forms & databases
(ii) Stratification is used to reduce the variance of estimates	B Observation of the work environment
(iii) Can be used to obtain a group consensus on problems, objectives and requirements.	C Questionnaires
(iv) Can be used to check the validity of data obtained directly from individuals	D Prototyping
(v) May minimize the time spent on fact finding and help define more stable and reliable requirements	E Joint Requirement Planning (JRP)

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

(48) Which of the following statements is/are true about fact finding and fact finding techniques?

(a) System analyst must take great care of the security and privacy of any facts.

(b) Fact finding is only performed in the early stage of the development cycle.

(c) Benchmarking can be used as a fact finding technique without incurring additional cost to the client.

(d) Observation allows the system analyst to do work measurements.

(e) Responses to questionnaire will always provide reliable and useful information.

49) What is/are true about the Joint Requirement Planning as a fact finding technique?

(a) In a brainstorming session, an idea is analyzed soon after it is presented by a participant.

(b) JRP encourage users and management to take the ownership of the project.

(c) Prototyping is used as a means for confirming the requirements.

(d) JRP is used as a main fact finding technique in SPIRAL model

(e) It is advised to conducted JRP sessions in the client company itself.

50) Consider the following steps involved in fact finding.

Step	Description
A	Observe the system in action
B	Build discovery prototypes to identify any functional requirements
C	Conduct interviews to gather requirements
D	Learn from existing documents, Forms, reports and files
E	Design and distribute questionnaires
F	Follow up and use appropriate fact finding techniques to verify facts

Choose the correct order of steps.

(a) A, B, C, D, E, F

(b) E, C, D, B, A, F
(c) D, A, E, C, B, F
(d) A, E, D, B, C, F
(e) D, E, C, A, F, B

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