



UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

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IT2404: Systems Analysis and Design

Multiple Choice Question Paper

29th July 2012

(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) An Information system that captures and reproduces the knowledge of an expert problem solver or decision maker and simulate the thinking of that expert is called

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

2) An Information System that either helps to identify decision-making opportunities or provides information to help make decisions is called

- (a) an Expert system.
- (b) a Transaction Processing system.
- (c) a Decision support system.
- (d) an Executive Information System.
- (e) a Communication and collaboration system.

3) Which of the following is/are correct about stakeholders of an Information System?

- (a) The Systems Analyst is a stake holder who bridges the communication gap between those who need computer-based business solutions and those who understand information technology.
- (b) System users are very much concerned with cost and benefits of the system.
- (c) System Analyst is a specialist who translates system users' business requirements and constraints into technical solutions.
- (d) Database administrator is a specialist in database technologies who designs and coordinates changes to corporate databases.
- (e) System Designers construct the system according to the System Analyst's specifications.

4) 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. These include

- (a) systems programming skills.
- (b) working knowledge of information technologies.
- (c) general knowledge of business processing and terminology.
- (d) general problem solving skills.
- (e) good interpersonal relations skills.

5) Consider the following architectures.

- (i) File Server architecture
- (ii) Client/Server architecture
- (iii) Internet-based architecture

Which of the above is/are distributed information system architectures?

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

6) Identify the traditional, system development phases.

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

7) Which of the following is/are underlying principles for Systems Development?

- (a) Get the System Users involved
- (b) Document throughout development
- (c) Design the System for Growth and Change
- (d) Manage the Process and Projects
- (e) Should not justify Information Systems as Capital Investments.

8) Which of the following is/are correct regarding System Development phases?

- (a) Size and boundaries of the project are established during the scope definition phase.
- (b) Diagrams drawn during the logical design phase should include implementation details.
- (c) Logical design phase translates business requirements into system models.
- (d) Physical design phase addresses greater detail about how technology will be used in the new system.
- (e) Design by specification and design by prototyping are two extreme philosophies of physical design.

9) A technical pictorial representation that shows what a system is or does and how the system is implemented is called a/an

- | | | |
|---------------------|-----------------------|---------------------------|
| (a) logical model. | (b) physical model. | (c) implementation model. |
| (d) business model. | (e) conceptual model. | |

10) Which of the following is/are correct regarding Process Modeling?

- (a) It is a technique used to organize and document a system's data.
- (b) Context diagram is a special type of process model that illustrates the communication focus from the system owners' and users' perspective.
- (c) DFDs are used to identify the physical movements of the documents.
- (d) DFD is a process modeling technique used in UML.
- (e) Logical models allow us to communicate with end users in non technical or less technical languages.

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

- (i) Q. Is there a standard symbol used to represent a *Process* in DFDs?
A. No. It depends on the methodology.
- (ii) Q. What is the *External Agent* symbol used in Gane and Sarson Methodology?
A. Rectangle
- (iii) Q. Is the following statement correct?
"The environment of an information system includes *External Agents* that form the boundary of the system and defines places where the system interfaces with its environment."
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 | |

12) 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, several processes can operate in parallel indicating that 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 logic, policies and procedures to be implemented by a system's processes.
- (d) A single DFD cannot include processes that happen hourly, daily, weekly, yearly and on demand.
- (e) A process in a Data flow diagram is represented by a circle.

13) Consider the following statements related to External Agents in a DFD.

- (i) External Agents on a logical DFD may include people, business units and other internal systems with which a system must interact.
- (ii) External Agents are also called External Entities.
- (iii) Gane and Sarson Symbol for External Agent 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 | |

14) Fill in the blank.

The following Gane and Sarson symbol is used to represent in a DFD.



Which of the following is most suited to fill the above blank?

- | | | |
|-------------------------|------------------------|-----------------|
| (a) primitive processes | (b) physical Processes | (c) data stores |
| (d) data flows | (e) logical Processes | |

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

- (i) Q. What is a Primitive Process?
A. It is the lowest level of detail shown in a process model..
- (ii) Q. What is the symbol used in Gane and Sarson notation to represent an Primitive process?
A. Circle
- (iii) Q. Is it illegal to have two Processes directly connected in a DFD?
A. Yes. A data store is needed to exchange data flows between processes.

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?

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|---|
| (a) Data modeling is a technique for organizing and documenting a system's data.. |
| (b) An Entity is something about which the business needs to store data. |
| (c) An Entity in an ERD is always represented by a rounded rectangle. |
| (d) Entity is a descriptive property or a characteristic of an attribute. |
| (e) Data Flow Diagram is a data model utilizing several notations to show data in terms of entities and relationships described by that data. |

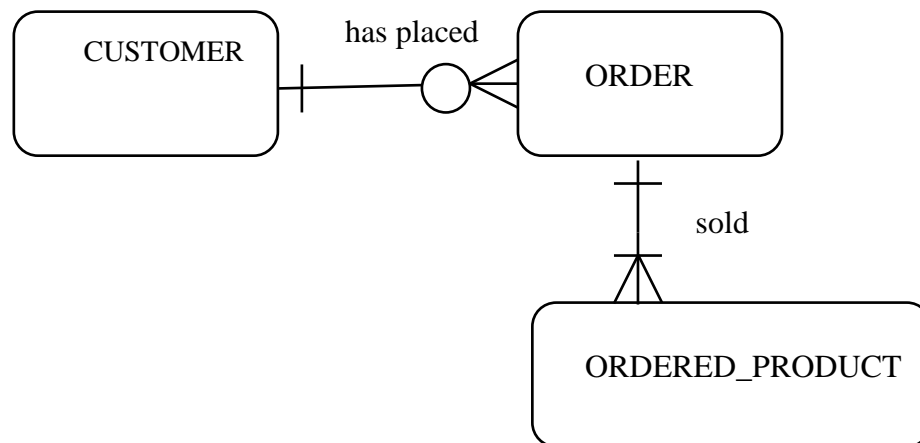
17) Some questions related to entity modeling with possible answers are given below.

- (i) Q. What is a domain?
A. It is a property of an attribute that defines what values the attributes can legitimately take on.
- (ii) Q. What is a Recursive relationship?
A. It is the name given for a relationship that exists between different instances of the same entity.
- (iii) Q. Degree defines the number of entities that participates in a relationship. What is the degree of a recursive relationship?
A. One

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 to answer questions 18 and 19.



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

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|---|
| <ul style="list-style-type: none">(a) The degree of the relationship between Customer and Order is 2.(b) The cardinality interpretation of the Customer end of the Customer – Order relationship is one or more.(c) It is a Document flow diagram.(d) The relationship that exists between Order and Ordered_Product entity is called a recursive relationship.(e) A Customer has placed zero or more Orders. |
|---|

19) Which of the following statements is/are correct regarding the given diagram?

- | |
|---|
| <ul style="list-style-type: none">(a) <i>has placed</i> is an aggregation name.(b) The given diagram uses Chen's notation.(c) An Order is placed by exactly one Customer.(d) An Order must contain at least one Ordered_Product.(e) An Order sold one or more Ordered_Products. |
|---|

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

	Column A		Column B
(i)	Unified Modeling Language	A	Something that is or is capable of being seen, touched , or otherwise sensed and about which the users store data and associate behaviour.
(ii)	Object	B	A set of modelling conventions that is used to specify or describe a software system in terms of objects
(iii)	Generalization /Specialization	C	An aggregation relationship in which the “whole” is responsible for the creation and destruction of its “parts”
(iv)	Composition	D	The concept that different objects can respond to the same message in different ways
(v)	Polymorphism	E	A technique wherein the attributes and behaviors that are common to several types of object classes are grouped into their own class called a Supertype

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) & B	(ii) & A	(iii) & E	(iv) & C	(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) CASE
- (ii) Inheritance
- (iii) message
- (iv) Polymorphism
- (v) Encapsulation
- (vi) RAD

What is the most appropriate way of filling the blanks?

- 21) is system development strategy that emphasizes speed of development through extensive user involvement in the rapid, iterative and incremental construction of a series of functioning prototypes of a system.

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

- 22) is the use of automated software tools that support drawing and analysis of system models and associated specifications.

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

- 23) The packaging of several items together into one unit is called.....

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

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

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

25) literally meaning “many forms”, the concept that different objects can respond to the same message in different ways.

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

26) Which of the following is/are correct regarding the scope definition phase?

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|--|
| (a) The first phase of a typical project is the scope definition phase.
(b) Boundaries of the project are identified during this phase.
(c) Estimating the cost involved can be done accurately during this phase.
(d) The participants in the scope definition phase primarily include system designers and system builders.
(e) The following is a typical question needed to be answered during this phase.
“Is the problem worth looking at?” |
|--|

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

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|---|
| (a) It is the first phase of a typical project.
(b) It defines and prioritizes the business requirements.
(c) During this phase, the analyst approaches users to find out what they need or want out of the new system, carefully avoiding any discussion of technology or technical implementation.
(d) Errors and omissions in requirements analysis result in user dissatisfaction with the final system and costly modification.
(e) During this phase, an analyst will find out what the system must do and how it should do those things. |
|---|

28) Consider the following statements related to Feasibility Study.

- (i) Feasibility is the measure of how beneficial or practical an information system will be to an organization.
- (ii) Feasibility analysis is the process by which feasibility is measured.
- (iii) Feasibility should be measured during the Scope Definition phase.

Which of the above statements(s) is/are correct?

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

Questions (29) to (34) are related to the following feasibility tests.

- (i) Operational Feasibility
- (ii) Cultural Feasibility
- (iii) Technical Feasibility
- (iv) Schedule Feasibility
- (v) Economic Feasibility
- (vi) Legal Feasibility

29) Fill in the blanks using one of the above feasibility tests.
..... evaluates whether the system can work.

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

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

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

31) asks whether a system will work in a given organizational climate. One question how it addresses this concern is :

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

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

32) addresses the following three major issues.

1. Is the proposed technology or Solution practical?
2. Do we currently possess the necessary technology?
3. Do we possess the necessary technical expertise?

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

33) is the measure of the cost effectiveness of a project or solution.

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

34) is the measure of how reasonable a project time table is.

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

35) Consider the following :

- (i) CASE
- (ii) Application Development Environments
- (iii) Project and Process Managers

Which of the above is a/are class(es) of automated tools for developers?

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

- 36) Consider the following statements related to CASE.
- (i) At the center of a CASE tool's architecture, there is a developer's database called a CASE repository.
 - (ii) Around the CASE repository, there is a collection of tools or facilities for creating computer programs.
 - (iii) Microsoft Visual Studio is an example of a CASE tool.

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) Fill in the blank space.
..... is / are example(s) for Application Development Environments.

- | | | |
|-------------------------------|-------------------------|-----------------------------|
| (a) Oracles Designer 2000 | (b) Oracles's Developer | (c) Microsoft Visual Studio |
| (d) Popkin's System Architect | (e) Borland's J Builder | |

- 38) Which of the following statement(s) is/are correct regarding Process and Project Management?

- | |
|---|
| (a) Microsoft Project is a Process Management tool. |
| (b) Process Management tools help us document and manage a methodology and routes, its deliverable, and quality management standards. |
| (c) For any system development project, effective project management is necessary to ensure that the project meets the deadline. |
| (d) Project Management tools do not have facilities to monitor the progress against schedule and budget. |
| (e) Process Management tools provide all the facilities necessary to develop new application software with maximum speed and quality. |

- 39) Which of the following statement(s) is/are correct regarding Project Management?

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|--|
| (a) 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. |
| (b) Project Management is the activity by which feasibility of developing an information system is measured and assessed. |
| (c) Microsoft Visio is a Project Management tool. |
| (d) PERT stands for Process Evaluation and Reengineering Technique. |
| (e) Gantt charts are effective when you want to study the relationships between tasks. |

- 40) Consider the following project management problems.

- (i) The team is not trained or skilled in some of the methodology's activities and requirements.
- (ii) Inadequate People management Skills
- (iii) Failure to adapt to business change

Which of the above is/ are project management related problems?

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

41) Which of the following statements are correct regarding fact finding in a systems project?

- (a) Conducting surveys through questionnaires can be considered as a fact finding technique.
- (a) A good systems analyst gets facts first from existing documentation, form, and files rather than from people.
- (b) Observation is a fact finding technique wherein the systems analyst either participates in or watches a person perform activities to learn about the system.
- (c) Fact finding is a technique that is used across the entire development life cycle, but it is extremely critical in the requirements analysis phase.
- (d) DFD is a popular fact finding technique.

42) Analysts often check for documentation of previous systems studies and designs performed by former systems analysts and consultants. This documentation may include

- (a) various types of diagrams.
- (b) project dictionaries and repositories.
- (c) accounting records.
- (d) program documentation.
- (e) design documents such as inputs, outputs and databases.

43) Identify the disadvantages of using 'Observation of the work environment' as a fact finding method.

- (a) Data gathered is not reliable.
- (b) The work being observed may not involve the level of difficulty or volume normally experienced during that time period.
- (c) Observation is relatively expensive compared with other methods.
- (d) Some tasks may not always be performed in the manner in which they are observed by the systems analyst.
- (e) Some system activities may take place at odd times, causing scheduling inconvenient for the systems analyst.

- 44) Consider the following statements.
- (i) Using questionnaires is a very expensive technique to gather facts.
 - (ii) People can complete and return questionnaires at their convenience.
 - (iii) Questionnaires allow people to maintain anonymity.
- Which of the above is/are correct regarding using questionnaires as a fact finding technique?
- (a) Only (i).
 - (b) Only (i) and (ii).
 - (c) Only (ii) and (iii).
 - (d) Only (i) and (iii).
 - (e) All
- 45) Consider the following.
- (i) Overtime calculation
 - (ii) Performance
 - (iii) Control requirements in which the system must operate.
- Which of the above is/are non functional requirement types?
- (a) Only (i)
 - (b) Only (ii)
 - (c) Only (i) and (ii)
 - (d) Only (ii) and (iii)
 - (e) All
- 46) What are the advantages of the Interview as a fact finding technique?
- (a) Gives an opportunity to motivate the interviewee to respond freely and openly.
 - (b) It allows the systems analyst to probe for more feedback from the interviewee.
 - (c) It is not an expensive approach.
 - (d) It is not time-consuming.
 - (e) It gives the analyst an opportunity to observe the interviewee's nonverbal communication.
- 47) Consider the following statements related to physical data flows.
- (i) It may represent the planned implementation of an input to or output from a physical process.
 - (ii) It may represent a data base command or action such as create , read etc.
 - (iii) It may represent the import of data from or the export of data to another information system across a network.
- 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 | |

48) 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 specially if it is online.	A	Interviews
(ii) Can conduct using software such as Skpe	B	Sampling
(iii) A process whereby highly structured group meetings are conducted for the purpose of analyzing problems and defining requirements	C	Questionnaires
(iv) The process of collecting representative sample of documents, forms and records	D	Prototyping
(v) Allows users and developers to experiment with the software and develop an understanding of how the system might work	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

49) Which of the following statement(s) is/are true about the Joint Requirements Planning (JRP)?

- (a) Many organization use JRP as a substitute for numerous and separate interviews.
- (b) JRP will increase the time spent on fact finding in one or several phases of the life cycle.
- (c) It is becoming increasingly common in systems planning and systems analysis to obtain group consensus on problems, objectives and requirements.
- (d) JRP sponsor is an individual who is in top management who has authority that spans over the different departments and users who are to be involved in the systems project.
- (e) JRP facilitator is responsible for keeping records pertaining to everything discussed in the meeting.

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

- (a) Application architecture is a specification of the technologies to be used to implement information Systems.
- (b) A Physical Data Flow Diagram is a process model used to communicate the technical implementation characteristics of an information system.
- (c) A physical process is either a processor such as a computer or person, or the implementation of specific work to be performed such as a computer program or manual process.
- (d) Each logical process must be implemented as one or more physical processes as some logical processes must be split into multiple physical processes due to several reasons.
- (e) External agents in a logical DFD will be mapped to several External agents in a physical DFD.
