



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***

28<sup>th</sup> July 2013

(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) Identify the type of Information system that supports a wide range of business office activities that provide for improved work flow between workers.

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

- 2) Consider the following incomplete sentence.

..... is a person whose job involves creating, collecting, processing, distributing, and using information.

How should the 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 is/are correct about Information workers of an Information System?

- (a) The Systems Analyst is a stake holder whose job involves creating and using information
- (b) A System User is responsible for funding the project of developing, operating, and maintaining the information system.
- (c) A System Designer is a specialist who translates system users' business requirements and constraints into technical solutions.
- (d) Systems Programmers are specialists who convert business requirements and statements of problems and procedures into computer languages.
- (e) Webmasters are specialists who design web servers.

- 4) Consider the following skills of an information worker.

- (i) Systems Programming experience and expertise
- (ii) Specialized knowledge of database languages and technology to build, modify and test database structures
- (iii) General knowledge of business processing and terminology

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) Consider the following statements.
- (i) Distributed computing moves information and services closer to the customers that need them.
  - (ii) In general, distributed system solutions are more user friendly because they use the PC as the user interface processor.
  - (iii) A Network Computing System is a multitier solution in which the presentation and presentation logic layers are implemented in client server Web browsers using content downloaded from a Database\ server.

Which of the above is/are true with regard to distributed information system architectures?

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

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

- (a) Systems development is a natural sequential process, moving in one-way direction from phase to phase.
- (b) Incremental development approach and iterative development process are two different development strategies.
- (c) Waterfall approach has lost favour with most modern system developers.
- (d) Incremental development process is an approach to systems analysis and design that completes the entire information system in successive iterations.
- (e) Iterative development approach does not encourage to the completion of the development in successive iterations.

- 7) Consider the following statements.

- (i) To promote good communication between constantly changing stakeholders, documentation should be a working by product of the entire systems development effort.
- (ii) Both the process and the project must be managed.
- (iii) One should not cancel or revise scope if a large sum of money is already spent on the project.

Which of the above is/are general principles of any system development methodology?

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

- 8) Consider the following statements.

- (i) To achieve or improve systems integration, organizations turn to standards.
- (ii) In many organizations, the standards take the form of enterprise information technology architecture.
- (iii) Information technology architecture sets standards that serve to direct technology solutions and information systems to a common technology vision or configuration.

Which of the above is/are correct regarding establishing standards for a project?

- (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 System Development?

- (a) Methodology, modeling methods and tools are three major components of system development.
- (b) Extreme Programming is a system development methodology.
- (c) Rational Unified Process is a structured system development methodology.
- (d) System developing methodology and system development life cycle are the same.
- (e) Methodology can be purchased or homegrown.

10) Consider the following incomplete sentence.  
..... shows what a system is or does.

How should the blank space be filled?

- (a) Logical model.
- (b) Physical model
- (c) Implementation model
- (d) Technical model
- (e) Conceptual model

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

- (a) Process model is a physical model.
- (b) It is a technique used to organize and document systems processes.
- (c) ERDs are used to identify the physical movements of the documents.
- (d) DFD is a popular process model used in object oriented methodologies.
- (e) Process models do not allow us to communicate with end users.

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

- (i) Q. Can a data model have logical and physical versions?  
A. Yes.
- (ii) Q. What is the *Process* symbol used in Gane and Sarson Methodology?  
A. Rounded Rectangle
- (iii) Q. Is the following statement correct?  
“Decomposition diagram is used to show the top down functional decomposition and structure of a system. It is essentially a planning tool for more detailed process models.”  
A. Yes

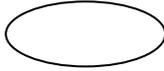
Which of the above pairs is/are correct?

- (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 Process modelling and DFDs?

- (a) The environment of an information system includes *processes* that form the boundary of the system and define places where the system interfaces with its environment.
- (b) An external agent defines a person, an organization unit, another system or another organization, that lies outside the scope of the project but which interacts with the system being studied.
- (c) Ideally, data stores should describe ‘things’ about which the business requires to store data.
- (d) External Agents are also called Data Entities.
- (e) A external entity in a Data flow diagram is represented by a circle.

- 14) Consider the following statements related to External Agents in a DFD.
- (i) External Agents on a logical DFD mean that the system interacts with these agents.
  - (ii) External Agents are also called External Data stores.
  - (iii) DeMarco/Yourdon 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

- 15) Consider the following incomplete sentence.  
The following Demarco/Yourdon symbol is used to represent ..... in a DFD.



How should the blank space be filled?

- (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 a primitive Process?  
A. It is a process which cannot be decomposed further.
- (ii) Q. What is the symbol used to represent a data store?  
A. It is an open ended box.
- (iii) Q. Is it illegal to have two data stores directly connected in a DFD?  
A. Yes. A process is needed to exchange data flows between data stores.

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 data modeling?

- (a) Data 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 always represented by a rectangle.
- (d) Attribute is a descriptive property or characteristic of an Entity.
- (e) A Use Case diagram is a data 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 occurrences of one entity that may be related to a single occurrence of the other entity.
- (ii) Q. What is a relationship?  
A. It is a natural business association between one or more entities.
- (iii) Q. What is cardinality?  
A. It defines the number of entities that participate in a relationship.

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) Domain
- (ii) Concatenated key
- (iii) Candidate key
- (iv) Primary key
- (v) Foreign key
- (vi) Associative entity

What is the most appropriate way to fill in the following blank spaces?

19) ..... is a primary key of an entity that is contributed to another to identify instances of a relationship.

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

20) The ..... is a property of an attribute that defines what values the attribute can legitimately take on.

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

21) A (An)..... is a candidate key that will most commonly be used to uniquely identify a single entity instance.

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

22) The entity employee may be uniquely identified by a national identity card number, or company assigned employee number, or email-address. Each of these attributes is called a (an).....

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

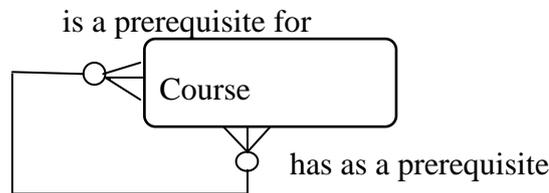
23) ..... ia a group of attributes that uniquely identifies an instance of an entity.

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

24) Composite key and compound key are synonyms for .....

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

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



- |   |
|---|
| (a) It shows a recursive relationship.                      |
| (b) Degree of the relationship is 2.                        |
| (c) A Course may be a prerequisite for other Courses.       |
| (d) A course has several other courses as its prerequisite. |
| (e) Course is an associative entity.                        |

Consider the following statements related to entity modeling.

- (i) Associate entity is an entity that inherits its primary key from more than one other entity.
- (ii) A Relationship that exists between different instances of the same entity is called recursive relationship.
- (iii) A foreign key is a primary key of the entity that is contributed to another entity to identify instances of a relationship.

26) 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)	Object Modeling	A	models actual object instances with current attribute values.
(ii)	An Object Diagram	B	is a technique for identifying objects within the systems environment and identifying the relationships between those objects.
(iii)	Generalization /Specialization	C	is the packaging of several items together into one unit.
(iv)	Encapsulation	D	shows the systems object structure.
(v)	Class Diagram	E	is a technique wherein the attributes and behaviours 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 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) Use Case diagram
- (ii) State machine
- (iii) Sequence diagram
- (iv) Polymorphism
- (v) Inheritance
- (vi) Generalization/Specialization
- (vii) Communication diagram

What is the most appropriate way of filling the blanks?

28) ..... shows the interactions between the system and external systems and users.

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

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

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

30) ..... graphically 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)	

31) ..... is drawn to show how events can change the state of an object over its lifetime.

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

32) ..... is applied in object oriented applications when a behaviour in the supertype needs to be overridden by a behaviour in the subtype.

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

33) ..... focuses on the structural organization of objects in a network format.

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

34) Which of the following is/are tasks of the scope definition phase?

- (a) Identify baseline problems and opportunities
- (b) Negotiate baseline scope
- (c) Identify and express system requirements
- (d) Asses baseline project worthiness
- (e) Develop baseline schedule and budget

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

- (a) System requirements that specify a property or quality the system must have are frequently referred to as functional requirements.
- (b) Efficiency is a nonfunctional requirement type classified by the PIECES framework.
- (c) During this phase the analyst approaches programmers to find out what they need or want out of the new system.
- (d) The purpose of requirements discovery and management is to correctly identify knowledge, process and communication requirements for the users of a new system.
- (e) During this phase, analyst will find out what the system must do and how it should be implemented.

**Questions (36) and (40)** 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

Fill in the blanks using the above items.

36) Political feasibility is another name given to .....

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

37) Operational feasibility evaluates whether a system can work in a given organizational climate whereas ..... asks whether a system will work in a given organizational climate.

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

38) ..... addresses the following issue.

“Do we possess the necessary expertise who have proficiency in practical skills.?”

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

39) Cost effectiveness of a project or solution is measured in .....

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

40) If a software development company works with contract programmers, the ownership of the program source code and non disclosure agreements have to be worked out in advance.  
..... addresses the above issue.

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

41) The benefits that a system provides can be categorized into Tangible and Intangible benefits. Consider the following benefits.

- (i) Decrease response time
- (ii) Better service to community
- (iii) Reduce expenses
- (iv) Improve employee morale
- (v) Better decision making

Which of the following correctly categorize the above?

- |                                 |                                     |
|---------------------------------|-------------------------------------|
| (a) Tangible : (i), (ii), (iii) | Intangible : (iv), (v)              |
| (b) Tangible : (i), (iii), (v)  | Intangible : (ii), (iv)             |
| (c) Tangible : (i), (ii)        | Intangible : (ii), (iv), (v)        |
| (d) Tangible : (i), (iii), (iv) | Intangible : (ii), (v)              |
| (e) Tangible : (i)              | Intangible : (ii), (iii), (iv), (v) |

42) Observation of the work environment is one of the most effective data collection techniques for learning about a system. Which of the following is/are disadvantages of the above method?

- |   |
|---|
| (a) It does not allow Systems Analyst to do work measurements.  |
| (b) It is expensive compared with other fact finding techniques.  |
| (c) Systems Analyst cannot identify tasks that have been missed or inaccurately described by other fact finding techniques. |
| (d) Data gathered using this method is not reliable.  |
| (e) Some system activities may take place at odd times, causing scheduling inconvenience for the Systems Analyst.           |

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

- |   |
|---|
| (a) Most questionnaires cannot be answered quickly.   |
| (b) It is relatively expensive means of gathering data from a large number of individuals.  |
| (c) It does not allow 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) They do not give the analyst an opportunity to motivate the interviewee.
- (ii) They do not allow the systems analyst to probe for more feedback from the interviewee.
- (iii) They are very time consuming and therefore a costly approach.

Which of the above is/ are disadvantages of using interviews as a fact gathering technique?

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

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

- (a) Information engineering is model driven and data-centered, but is a process sensitive technique for planning, analysing and designing information systems.
- (b) Prototyping does not encourage active end user participation.
- (c) Physical Data Flow Diagram (DFD) is a data model used to show the technical implementation characteristics of an information system.
- (d) Data Stores in a logical DFD will always be mapped to several Data Stores in a physical DFD.
- (e) During prototyping, the scope and complexity of the system can quickly expand beyond the original plan, This can easily get out of control.

46) Consider following statements related to system design.

- (i) Prototyping increases end user morale and support for the project because the system appears real to them.
- (ii) Rapid application development is the merger of various structured techniques with prototyping techniques and joint application development techniques to accelerate system development.
- (iii) System design tasks for in-house development can be identified 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 computer or 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 CASE.

- (i) CASE tools help systems analysts to automate some of the system modeling tasks.
- (ii) Forward engineering is a CASE tool capability that can automatically generate initial system models from software or database code.
- (iii) Documentation tool is a facility available in CASE tools to analyze system models, specifications and designs for completeness, consistency and conformance to accepted rules of the methodologies.

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

Consider the following tools.

- (i). Oracles Developer
- (ii). Sybase Powerbuilder
- (iii). IBM's Websphere

49) Which of the above is/are CASE tools?

- (a) Only (i)
- (b) Only (ii)
- (c) Only (i) and (ii)
- (d) Only (ii) and (iii)
- (e) None of the above

50) Consider the following problems and consequences.

- (i) Failure to establish upper management commitment to the project – sometimes commitment changes during a project.
- (ii) Poor estimating techniques – Many systems analysts estimate by making a best calculated estimate and then doubling that number. This is not a scientific approach.
- (iii) Inadequate people management skills – Managers tend to be thrust into management positions and are not prepared for management responsibilities

Which of the following is/are project management problems and consequences?

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

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