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

26th July 2015

(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 **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 **one or more** correct answers.
- All questions will carry equal marks.
- There will be a penalty for incorrect responses to discourage guessing.
- The mark given for a question will vary from 0 (*All the incorrect choices are marked & no correct choices are marked*) to +1 (*All the correct choices are marked & no incorrect choices are marked*).
- Answers should be marked on the special answer sheet provided.
- Note that questions appear on both sides of the paper.

  If a page is not printed, please inform the supervisor immediately.
- Mark the correct choices on the question paper first and then transfer them to the given answer sheet which will be machine marked. **Please completely read and follow the instructions given on the other side of the answer sheet before you shade your correct choices.**

1) Which of the following are types of information systems that help employees create and share documents that support day-to-day workplace activities.

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

2) What is the best way of filling the blanks in the following uncompleted sentence?
…… is a technical specialist such as web architect who translates system users' business requirements and constraints into technical solutions.

(a) A system user
(b) A system owner
(c) A systems analyst
(d) A project manager
(e) A system designer

3) Which of the following is/are correct regarding the type of system builders?

(a) Application programmers are specialists who convert business requirements and statements of problems and procedures into computer languages.
(b) Web architect is a specialist who codes and maintains Webservers.
(c) System programmers are specialists who develop tests and implement operating system-level software, utilities and services.
(d) Database programmers are specialists in database languages and technology who build, modify and test database structures and programs that use and maintain them.
(e) Security administrators are specialists who design, implement, troubleshoot and manage security and privacy controls in a network.

4) Consider the following skills.
(i) Computer programming experience and expertise
(ii) General knowledge of business processes and terminology
(iii) Business process re-engineering skills

Which of the above skills is/are needed by systems analysts?

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

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

(i). Information system

(ii). Waterfall development approach

(iii). System development process

(iv). Iterative development approach

(v). Incremental development process

……A…….. is a set of activities, methods, best practices, deliverables and automated tools that stakeholders use to develop and continuously improve ……B…….. and software.

The ……..C…… has lost favour with most modern system developers. A more popular strategy is the …….D…… or the ……E…….

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

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

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

(a) It is the first phase of a typical project.
(b) During this phase the size and the boundaries of a projects are established.
(c) Business requirements are translated into system models during this phase.
(d) Baseline problems and opportunities are identified during this phase.
(e) Baseline schedule and budget are developed during this phase

7) Consider the following tasks in connection with software development.

(i) Specify the resources allocated to the project.
(ii) Produce a Technical document written by the system analyst.
(iii) Identify candidate solutions.

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

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

8) Consider the following with respect to system development.

(i) Establish phases and activities.
(ii) Get the system users involved.
(iii) Do not be afraid to cancel or revise scope.

Which of the above is/are underlying principles for systems development?

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

9) Consider the following problem solving steps.

(i) Define the requirements that must be met by any solution.
(ii) Design and implement the chosen solution.
(iii) Study and understand the problem, its context and its impact.
(iv) Identify the candidate solutions that fulfill the requirements and select the best solution.
(v) Observe and evaluate the solution's impact and refine the solution accordingly.

Which of the following gives the correct order of the steps?

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

10) Fill in the blank space.

..... phase in the system development life cycle defines and prioritizes the business requirements..

(a) Requirement analysis (b) Project initiation (c) System design
(d) System development (e) Scope definition

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

(a) This phase answers the question "Should we purchase software or build it ourselves?"
(b) Candidate solutions are analyzed during this phase.
(c) This phase answers the question "Is a new system really worth building?"
(d) This phase answers the question "What capabilities should the new system provide for its users?"
(e) This phase requires decisions about what the system must do.

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

(i) Q. What is Data Modeling?
A. It is a technique for organizing and documenting a system's data.

(ii) Q. Define an Entity in Data Modeling?
A. It is a data model utilizing several notations to show data in terms of the entities and relationships described by that data.

(iii) Q. Is the following statement correct?
" In a library system *Member*, *Book* and *Copy* are possible entities "
A. No

Which of the above answers is/are correct?

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

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

(a) *Chen*, *Martin* are examples of notations used when drawing Entity Relationship Diagrams (ERD).
(b) An *Entity* is a concept that abstractly represent all instances of a group of similar things.
(c) An *Entity* in an ERD is represented by a rounded rectangle.
(d) Data modelling is a technique used to identify business events and responses.
(e) *Persons, places, objects, events and concepts* are examples of categories of *Entities*.

14) Consider the following statements related to Process modelling.

(i) Process models are always implementation dependent.
(ii) Logical process models show what the system is or does.
(iii) Physical models allow us to communicate with end users in nontechnical or less technical languages.

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) Fill in the blank space.

A/An ……. defines a person, an organizational unit, another system or another organizations that lies outside the scope of the project but interacts with the system being studied.

(a) primitive process
(b) external agent
(c) data Store
(d) data flow
(e) process

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

(i) Q. What is a Data Store?
A. It describes 'things' about which the business wants to store data.

(ii) Q. What is the symbol used to represent a Data Store?
A. It is a rounded rectangle.

(iii) Q. Is it correct to have a Data store directly connected to another Data store in a DFD?
A. Yes.

Which of the above answers is/are correct?

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

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

(a) Data modeling is a technique used for defining business requirements for a database.
(b) A Process model should always show how a system is technically implemented.
(c) Logical process models are used to document an information system's process focus from the system owners' and system users' perspective.
(d) A decomposition diagram shows the top-down functional decomposition and structure of a system.
(e) A decomposition diagram is essentially a planning tool for more detailed process models such as Data Flow Diagrams.

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

(i) Q. What does the number of entities that participate in a relationship called?
A. Domains

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

(iii) Q. What is the degree of the relationship between the *student* and a *course* in a course registration system?
A. Two

Which of the above answers is/are correct?

(a) Only (i) (b) Only (i) and (ii) (c) Only (ii)
(d) Only (ii) 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) – (vii).

(i) Generalization
(ii) Entity
(iii) Subtype
(iv) N-ary Relationship
(v) Foreign keys
(vi) Supertype
(vii) Abstract

What is the most appropriate way to fill in the given blanks?

19) …… is a relationship that exist between more than two different entities.

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

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

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

21) An entity ……. is an entity whose instances store attributes that are common to one or more entity subtypes.

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

22) An entity …… is an entity whose instances inherit some common attributes from an entity supertype and then add other attributes that are unique to an instance of the subtype.

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

23) Most people associate the concept of ..... with modern object-oriented techniques.

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

24) A relationship implies that instances of one entity are related to instances of another entity. We should be able to identify those instances for any given entity. The ability to identify specific related entity instances involves establishing ……

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

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

(a) Decomposition diagrams and data flow diagrams prove to be very effective tools for identifying processes, but they are not good at showing the logic inside those processes.
(b) Decision trees are divided into two parts, the conditions and actions.
(c) Structured English is a language syntax for specifying the logic of a process.
(d) The overall structure of a structured English specification is built using the fundamental constructs that have governed structured programming for nearly three decades.
(e) Decision table can be used to describe an elementary process descriptions.

26) Consider the following statements related to process modeling.

(i) Complex elementary processes may be described by policies that are expressed in decision tables which show complex combinations of conditions that results in specific actions.

(ii) An event diagram is a context diagram for a single event.

(iii) The event diagrams serve as a meaningful context to help users validate the accuracy of each event to which the system must provide a response.

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)	Event Diagram	A	is a process model used to show the flow of data through a system and the processing performed by the system.
(ii)	Data Flow Diagram	B	is a data flow diagram that shows the context for a single event.
(iii)	Elementary Process	C	is the concept wherein methods and/or attributes defined in an object class can be inherited or reused by another object class.
(iv)	Inheritance	D	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.
(v)	Generalization/specialization	E	can be further described by procedure logic using decision trees.

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) State machine
(ii) Class diagram
(iii) Activity diagram
(iv) Sequence diagram
(v) Communication diagram
(vi) Polymorphism
(vii) Encapsulation

What is the most appropriate way to fill in the blanks?

28) ……. shows the interaction of objects via messages. It focuses on the structural organization of objects in a network format.

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

29) …… models how events can change the state of an object over its life time. It is drawn specially for objects having significant dynamic behavior.

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

30) …….. provides an overview of the target system by describing the objects and classes inside the system and the relationships between them.

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

31) ……. . illustrates how messages are sent and received between objects and in what order.

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

32) …… are graphical representations of workflows of stepwise actions with support for choice, iteration and concurrency.

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

33) …… is applied in object oriented applications when a behaviour in the super-type needs to be overridden by a behaviour in the sub-type.

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

34) Consider the following statements in relation to using observations as a requirements discovery methods.

(i) People may let you see only what they want you to see.
(ii) Observations always provide an accurate measure of the work volume.
(iii) Data gathering through observations may be highly unreliable.

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) Requirements are often categorized as functional or nonfunctional requirements.
(b) System requirements that specify what information systems must do are frequently referred to as non-functional requirements.
(c) Requirement discovery for a system does not depend on the analysts' ability to first discover and then analyze the problems and opportunities which exist in the current system.
(d) Requirement definition document should consist of functions and services the system should provide.
(e) Requirement definition document should consist of information about other systems with which the system must interface.

The blanks in the Questions 36 – 40 have to be filled by selecting the most appropriate words/phrases from the list labelled (i) – (viii). Note that one word/phrase may be used in more than one instance.

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

36) What is the most appropriate way of fill in the blanks?

…….. feasibility is a measure of how well a solution could be implemented within contractual and legal obligations.

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

37) Cultural feasibility asks whether a system will work in a given organizational climate, whereas ……. evaluates whether system can work in an organizational climate.

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

38) ……. addresses the following issue.

"Which end users or managers may resist or not use the system?"

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

39) ……. is used to rank candidate systems.

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

40) …… addresses the following three major issues.

(i) Is the proposed technology or solution practical?

(ii) Do we possess the necessary technical expertise?

(iii) Do we currently possess the necessary technology?

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

41) Which of the following statement(s) is/are true regarding the fact gathering technique 'observing the work environment'?

(a) It allows systems analyst to do work measurements.
(b) Observation is relatively expensive compared with interviews.
(c) The tasks being observed are subjected to various types of interruptions.
(d) Some tasks may not always be performed in the manner in which they are observed by the system analyst.
(e) Analyst cannot obtain data describing physical environment of the task.

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

(a) Questionnaires are not recommend for a situation where opinion of the employees of a large organization is needed
(b) There are two types of interviews, namely structured and unstructured.
(c) The two types of questionnaires are Free-format and Fixed-format.
(d) Leading questions, loaded questions and biased 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/are true about questionnaires?

(a) It is a very expensive technique if online questionnaires are used.
(b) It is a relatively expensive means of gathering data from a large number of individuals.
(c) It allows individuals to maintain anonymity when answering the questionnaires.
(d) Teleconferencing facility can be arranged if the location is very far.
(e) Responses can be tabulated or analyzed quickly if online questionnaires are used..

44) Consider the following statements related to Interviews.

(i) In structured interviews, the interviewer has a specific set of questions to ask from the interviewee.
(ii) It permits the systems analyst to reword questions for each individual.
(iii) They are not time consuming and therefore not 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 (ii) and (iii) (e) All

45) Structured design seeks to factor a program into the top-down hierarchy of modules which have the following properties/property.

(a) Loosely cohesive
(b) Highly cohesive
(c) Loosely coupled
(d) Tightly coupled
(e) Specialized

46) Consider following statements related to system design.

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

(ii) The prototyping approach is an interactive process involving a close working relationship between the designer and the users.

(iii) System design tasks for in-house development can be categorized as follows: the application architecture design, the system databases development, the system interface design, the programs writing to access the databases.

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?

(a) Main aim of modelling is to emphasize the business problem.
(b) Each physical process must be implemented as two or more logical processes.
(c) Physical Data flow diagrams show different implementations of a physical process as two or more logical processes.
(d) New processes may be added to Physical Data flow diagrams to show the implementation of security requirements.
(e) External agents 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) IDE's only help systems analysts to automate the system implementation tasks.
(ii) Process manager tool is an integrated software development tool that provides all the facilities necessary to develop new application software with maximum speed and quality.
(iii) Project manager application tools 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) Only (iii)

49) Consider the following tools.

(i) NetBeans
(ii) Visual Studio .NET
(iii) Sybase's Powerbuilder

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) All

50) Consider the following statements related to project management.

(i) Project Management is the activity of documenting , managing and continually improving the process of systems development.
(ii) Project Management is necessary to ensure that the project meets deadlines.
(iii) Project Managers use PERT charts to show project tasks and the relationship between these tasks.

Which of the above 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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