UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)
Academic Year 2018 – 1st Year Examination – Semester 2

IT2405: Systems Analysis and Design

Multiple Choice Question Paper

23rd September 2018

(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.**
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1) Which of the following statements is/are correct regarding an Expert System?

(a) It processes business transactions such as orders, time cards, payments and reservations.
(b) It uses the transaction data to produce information needed by managers to run the business.
(c) It is tailored to the unique information needs of executives who plan for the business and assess performance against those plans.
(d) It captures and reproduces the knowledge of an expert problem solver.
(e) An MIS primarily serves the functions of planning, controlling and decision making at the management level.

2) When requirements are not identified correctly, what could happen from among the following?

(a) The system may cost more than the estimated cost.
(b) The system may be delivered later than planned.
(c) The system will become unreliable and prone to errors.
(d) The system may not meet all user requirements.
(e) The system development should be outsourced.

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

(a) Reduce Business Costs
(b) Increase Efficiency
(c) Reduce the employees with technical knowledge
(d) Improve decision making
(e) Fewer mistakes

4) Legacy systems are considered to be systems which are,

(a) difficult to maintain due to inadequate system documentation.
(b) Always very user friendly
(c) Always complex and difficult to develop
(d) outdated software systems that rely on obsolete programming languages.
(e) associated with terminology or processes that are no longer applicable to current contexts or content.

5) Which of the following is/are true regarding waterfall approach for software development?

(a) It is best suited for projects where the requirements can be clearly defined.
(b) It groups development activities into a sequence of consecutive phases.
(c) It has a rigid process which is less flexible.
(d) It does not encourage top-down problem solving.
(e) Logical design activities are not carried out in it.

6) Consider the following statements.

i. User requirements are prioritized and the highest priority requirements are included in early increments.
ii. Once the development of an increment is started, the requirements are frozen, though requirements for later increments can continue to evolve.
iii. It is more suitable for the development of a safety critical software product where the whole system is required to be implemented at once.

Which of the above statements is/are correct regarding Iterative system development approach?

(a) (i) only.	(b) (iii) only.	(c) (i) and (ii) only.
(d) (i) and (iii) only.	(e) (i), (ii) and (iii).	

7) Which of the following is/are true about a system development Process?

(a) It is the same as systems development life cycle.
(b) It consist of standard set of steps that will be followed on any systems development project.
(c) It executes the system development stages of the system life cycle.
(d) It is an object oriented process.
(e) It uses a problem solving approach to develop the system

8) Which of the following is/are correct about the scope definition phase?

(a) The first phase of a typical project.
(b) Estimated budget is identified during this phase.
(c) Compile a list of requirements together with client, end users, experts and project team.
(d) Database management system to be used for the project has to identified during this phase.
(e) It establishes the size and boundaries of the project.

9) Which of the following is/are true regarding a Data Flow Diagram(DFD)?

(a) It identifies the system inputs and system outputs.
(b) Shows the flow of data through the system and the processing performed by the system.
(c) It is a logical Model which allow us to communicate with end users with non technical or less technical knowledge.
(d) Three symbols and one connection is used to draw DFDs
(e) Helps us to determine the main functionalities of the system.

10) Consider the following statements.

i. Several processes in a DFD might be executing or working simultaneously.
ii. System models and prototypes should be validated for completeness and correctness.
iii. DFD is a diagram that represents non-technical details in a system.

Which of the above statements is/are correct?

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

11) Match the statements in Column **X** with the most appropriate statement(s) from Column Y.

	Column X		**Column Y**
(i)	Functional requirements	**A**	characteristics of the proposed system.
(ii)	Non-functional requirements	**B**	is the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements.
(iii)	System Design	**C**	is used as a fact finding technique.
(iv)	Questionnaire	**D**	Illustrates data structures, business processes, data flows and user interfaces.
		E	can relate to hardware, software or both in terms of calculations, technical details, data manipulation and processing or other specific functionality that defines what a system is supposed to accomplish.

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

12) System requirements should be analyzed for their feasibility. Which of the following is/are correct regarding feasibility?

(a) It is used to measure how well a solution meets the identified system requirements.
(b) Feasibility of a system should be measured during the problem definition phase.
(c) Technical Feasibility is a measure of the Practicality of a technical solution and the availability of technical recourses and expertise
(d) Economic feasibility deals with how the end users feel about the proposed system.
(e) A measure of how reasonable a project time table line is done during schedule feasibility.

13) 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 four symbols and one connection.
(iii) Q. What is an external Entity?
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 (i) (b) Only (ii) (c) Only (i) and (ii) (d) Only (i) and (iii) (e) All

14) Match the non-functional requirements mentioned in Column **X** with the most appropriate definition from Column **Y**.

	Column X		**Column Y**
(i)	Accessibility	**A**	is when the requirements are defined so that they can be demonstrated during testing.
(ii)	Efficiency	**B**	The requirements should truly fulfill the purpose of the system.
(iii)	Portability	**C**	is the usability of the same software in different environments.
(iv)	Verifiable	**D**	signifies a level of performance that describes using the least amount of input to achieve the highest amount of output.
(v)	Extensibility	**E**	is where the implementation takes future growth into consideration.
		F	refers to the design of products, devices, services, or environments for people who experience disabilities.

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

15) 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) Elementary processes are the lowest level of details shown in a process model.
(c) Physical processes are work or actions that must be performed no matter how you implement the system.
(d) A process in a DFD represents the work performed by a system in response to incoming data flows.
(e) An external agent is a another business or information system that is separated from your system but with which your system must interface.

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

(a) Decision tree is tabular form of presentation that specifies a set of conditions and their corresponding actions.
(b) Decision tree is used to describe an elementary process in a DFD.
(c) An elementary process in a DFD cannot be decomposed further.
(d) Functional Decomposition Diagrams provide us with a beginning of an outline to draw a Data Flow Diagram.
(e) Use of a decision table is a better way of describing process logic involving multiple conditions

17) Which of the following is/are considered as fact finding techniques?

(a) Joint application development
(b) Observations.
(c) Object Orient analysis
(d) Research and site visits
(e) Questionnaires

18) Which of the following is/are **NOT** a component shown in Entity Relationship Diagrams?

(a) Entity	(b) Data stores	(c) Actors
(d) Relationship	(e) Data flows	

19) Consider the following statements in relation to Data Flow Diagrams(DFD).

(i) Context diagram in a DFD illustrates a systems interface to the business and outside world including other information systems.
(ii) It shows information about process timing or whether processes will operate in sequence or in parallel
(iii) DFD shows what kind of information will be input to and output from the system, how the data will advance through the system, and where the data will be stored.

Identify the correct statement(s) from the above.

(a) (i) only.	(b) (i) and (ii) only.	(c) (i) and (iiii) only.
(d) (ii) and (iii) only.	(e) (ii) only.	

20) Which of the following is/are true about Physical design models,

(a) They are implementation dependent models.
(b) They are initially used to describe business requirements.
(c) They help in identifying the business requirements precisely.
(d) They show how the system is physically and technically implemented.
(e) Easy to discuss with the potential users.

21) Identify the possible class(es) in a University Student Registration System from among the following.

(a) Reservation	(b) Student	(c) Course
(d) Lecturer	(e) Library	

22) Which of the following benefits is/are tangible benefits?

(a) Decrease response time
(b) Reduce expenses
(c) Improve employee morale
(d) Better service to community
(e) Improve customer goodwill

23) Which of the following is/are correct about Data Flow Diagrams (DFDs)?

(a) A general rule in data flow diagramming is that certain processes may have the same name.
(b) A data flow diagram should balance between levels. This refers to the fact that the level one DFD should have the same system inputs and outputs as the corresponding level zero DFD.
(c) Flowcharts are biased toward representing the physical characteristics of the system, while data flow diagrams can omit the physical system attributes.
(d) One example of an external agent on a data flow diagram is another system that provides inputs to or receives outputs from the system being studied.
(e) In data flow analysis, all flows must begin with or end at a processing step.

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

(a) Creating and using information.

(b) Developing, operating, and maintaining the information system.

(c)Translates system users' business requirements and constraints into programs.

(d) Requirement identification.

(e) Quality management.

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

(a) System requirements specify what the information system must do or what property or quality the system must have.
(b) Performance is a non-functional 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 not how it should be implemented.

26) Match column **X** with column **Y**.

Column X			**Column Y**
(i)	Context Data Flow Diagram	A	encourages and requires active end-user participation.
(ii)	An organizational chart	B	describes interrelated things of interest in a specific domain of knowledge.
(iii)	Prototyping	C	is a type of static structure diagram that describes the structure of a system.
(iv)	Class diagram	D	is a diagram that shows the structure of an organization and the relationships and relative ranks of its parts and positions/jobs.
(v)	Entity Modelling	E	illustrates a systems interface to the business and outside world including other information systems.

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

27 Consider the following relationships.

i. Aircraft and Glider
ii. Student and Undergraduate Student
iii. Account and Fixed Deposit Account
iv. Book and Copy
v. Car and Tyre
vi. Region City

Which of the above would form superclass-subclass pairs?

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

28) …….. allows different forms of the same service to be defined.

(a) Polymorphism (b) Inheritance (c) Aggregation
(d) Composition (e) Association

29) Consider the following statements in relation to Data modelling.

(i) Data modeling is a technique for defining business requirements for a database.
(ii) Entity Relationship Diagram is a data model utilizing several notations to show data in terms of entities and relationships described by that data.
(iii) Attribute is a descriptive property or characteristics of an entity.

Which of the following statements is/are correct?

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

Consider the following list of terms in answering the questions from 30-32.

i. Recursive
ii. Degree
iii. Entity
iv. Attribute
v. Associative entity

Fill in the blanks with the most appropriate term from the above list.

30) ……..……. is usually recognizable concept, either concrete or abstract, such as person, places, things, or events which have relevance to the database.

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

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

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

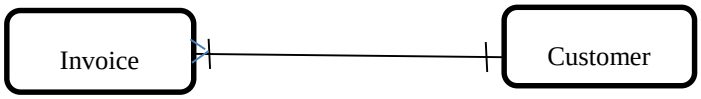
32) …….. is the number of entity sets that participate in a relationship.

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

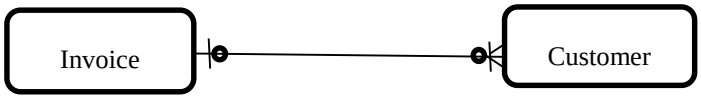
33) Consider the following scenario.
"An invoice is sent to one customer but there can be many invoices sent to the same customer, There can be a customer who has not being sent an invoice yet."

Identify the correct Entity Relationship Diagram modelling the above scenario.

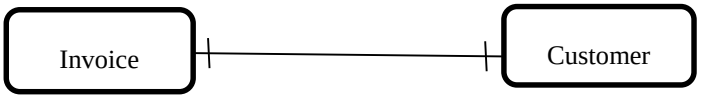
(a)



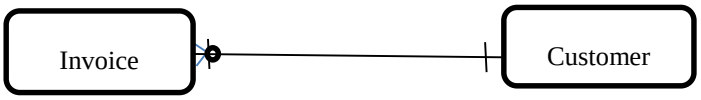
(b)



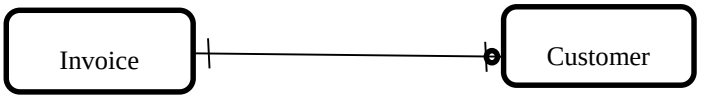
(c)



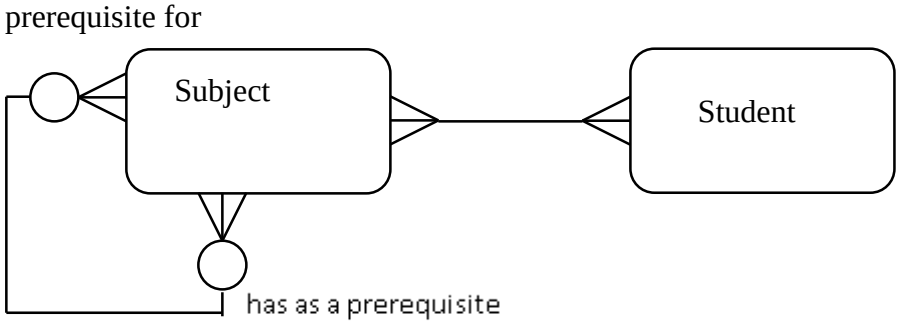
(d)



(e)



Consider the following diagram to answer questions 34 and 35.



34) Which of the following statements is / are true regarding the above Diagram?

(a) The degree of the relationship between Student and Subject is two.
(b) The cardinality interpretation of the Student end of the Student – Subject enrolment relationship is zero or more.
(c) The relationship that exists between different instances of the Subject entity is called an association relationship.
(d) A Subject may be a prerequisite of another Subject,
(e) All the subjects should have prerequisites

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

(a) A Subject may have several other subjects as its prerequisites.
(b) The given diagram uses the *Chens* notation.
(c) The given diagram is an Entity Relationship Diagram.
(d) The cardinality of the relationship between different instances of the Subject entity is 2.
(e) There can be subjects where no students are enrolled.

36) A measure of how well the solution will be accepted in a given organizational climate is referred to as the……

(a) Cultural feasibility. (b) Operational feasibility.
(c) Technical feasibility. (d) Economic feasibility.
(e) Legal feasibility.

37) What is meant by Economic feasibility?

(a) Availability of technology for the defined solution.
(b) is a measure of the Practicality of a technical solution.
(c) A measure of how reasonable a project time table is.
(d) How well the proposed system satisfies the system requirements identified in the requirements analysis phase.
(e) a measure of the cost-effectiveness of a project

38) Consider the following statements related to the Feasibility Study.

(i) Feasibility is the measure of how beneficial or practical an information system will be to an organization.

(ii) The Technical Feasibility Analysis takes into account the organization's current state, as well as existing resource capabilities and the availability/sustainability of new technological offerings.

(iii) Feasibility of a project can be changed during the system development.

Which of the above statements is/are correct?

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

39) Consider the following statements.

(i) Should not use a computer to harm the people.
(ii) Should not use proprietary software for which you have not paid.
(iii) Should always use a computer in ways that insure consideration and respect for fellow humans.

Which of the above statements is/are commandments of computer ethics?

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

40) If the end users cannot express the requirements of a system clearly, the best approach to capture the requirements is/are,

(i) Object Oriented Approach
(ii) Spiral Development
(iii) Iterative development using Prototyping
(iv) Data Flow approach

(a) (i) (b) (ii)
(c) (iii) (d) (iv)
(e) None of the above

Questions (41) to (46) 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

41) ……. is a measure of how well the solution will work in the organization.

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

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

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

43) ……. asks whether a system will work in a given organizational climate. A question that can be asked to address 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) (vi)	

44) ……. addresses the following three major issues.
(i) Is the proposed solution practical?
(ii) Do we currently possess the necessary technology?
(iii)Do we have the necessary technical expertise?

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

45) ……. a measure of how reasonable a project time table is.

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

46) ……..a measure of how well a solution can be implemented within existing legal and contractual obligations.

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

47) Given below are some statements associated with Object modelling. Identify the correct statement(s) from among them.

(a) Object oriented approach to system development is based on the concepts of objects that exist within a systems environment.
(b) Data that represents characteristics of interest about an object is called an entity.
(c) Types of objects may include a person, place, thing or event.
(d) The set of things that an object can do and that correspond to functions that act on the objects data is called a behavior.
(e) Object oriented analysis is concerned with defining static structure and dynamic behavior models of the information system instead of defining data and process models, which is the goal of traditional development approaches.

48) Given below are some statements associated with Object modelling and Process modelling. Identify the correct statement(s) from among them.

(a) The approach in object modeling that seeks to discover and exploit the commonalities between object classes is referred to as generalization/specialization.
(b) In a Data flow diagram, it is possible to have a data flow connected directly from one external entity to another.
(c) Process modeling is a technique for organizing and documenting a system's data.
(d) Functional decomposition diagram partitions the system into logical subsystems and/or functions.
(e) Methods and/or attributes defined in an objects class can be inherited or reused by another object class.

49) Which of the following is/are correct about CASE tools?

(a) They provide automation and reduce the time to complete many tasks, especially those involving diagramming and associated specifications.
(b) They generate user specific requirements.
(c) They do not support agile software development
(d) They Support reverse engineering
(e) They can generate code for you.

50) Which of the following statements is/are correct regarding Project Management and Process Management?

(a) Process Management tools help us document and manage a methodology and routes, its deliverables, and quality management standards.
(b) Project Management tools does not have facilities to monitor the progress against schedule and budget.
(c) Process Management tools provide all the facilities necessary to develop new application software with maximum speed and quality.
(d) Project management is the process of scoping, planning, staffing, organizing, directing and controlling the development of acceptable system at a minimum cost within a specified time frame.
(e) Gantt charts are effective when you want to study the relationships between tasks.

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