



UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

*Academic Year 2006/2007 – 1<sup>st</sup> Year Examination – Semester 2*

***IT2403: Systems Analysis and Design***

***Multiple Choice Question Paper***

**12<sup>th</sup> August, 2007  
(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 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) Information Systems can be classified as given below according to the functions they serve.

- |                                    |                                    |
|------------------------------------|------------------------------------|
| (a) Transaction processing systems | (b) Management information systems |
| (c) Distributed systems            | (d) Client-Server Systems          |
| (e) Expert Systems                 |                                    |

2) Which of the following groups of people are considered as stakeholders of an information system?

- |                      |                                |
|----------------------|--------------------------------|
| (a) System Users     | (b) External Service Providers |
| (c) System Designers | (d) System Owners              |
| (e) System Builders  |                                |

3) A system designer is a stakeholder who is responsible for

- |                                                                                           |
|-------------------------------------------------------------------------------------------|
| (a) funding the project for developing, operating and maintaining the information system. |
| (b) studying the problems and needs of an organization.                                   |
| (c) the construction of an information system.                                            |
| (d) translating business requirement constraints into technical solutions.                |
| (e) designing computer databases, inputs, outputs, screens, network and software.         |

4) Which of the following skill(s) is/are required by a systems analyst?

- |                                                                              |
|------------------------------------------------------------------------------|
| (a) Working knowledge of Information Technologies                            |
| (b) General knowledge of business processes and terminology                  |
| (c) General problem solving skills                                           |
| (d) Good interpersonal relations skills                                      |
| (e) Several years of experience in programming including systems programming |

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

- (i) Physical Models
- (ii) Logical Models
- (iii) Data Flow Diagrams
- (iv) Process Modelling
- (v) Processes

....**A**..... show what a system is or does whereas ....**B**.... show not only what a system is or does but also how the system is physically and technically implemented. ...**C**..... is a technique used for organizing and documenting the structure and flow of data through a system's ....**D**. ....**E**..... are drawn to show the flow of data through a system and the work or processing performed by that system.

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

6) Which of the following is **not** a traditional, basic system development phase?

- |                                     |                              |                           |
|-------------------------------------|------------------------------|---------------------------|
| (a) Logical Design                  | (b) Prototyping              | (c) Requirements Analysis |
| (d) Physical Design and integration | (e) Construction and testing |                           |

- 7) Consider the following diagrams
- (i) Data Flow diagram
  - (ii) Entity Relationship diagram
  - (iii) Functional Decomposition Diagram
- Which of the above techniques can be used to implement a methodology?
- |                       |               |                        |
|-----------------------|---------------|------------------------|
| (a) (i) Only          | (b) (ii) Only | (c) (i) and (iii) Only |
| (d) (i) and (ii) Only | (e) all       |                        |
- 8) Which of the following statements is/are correct regarding a methodology?
- |                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (a) A methodology uses modelling methods and tools.<br>(b) A methodology ensures that systems are built in the most effective way.<br>(c) A methodology does not follow a predefined set of steps.<br>(d) Tools will support methodologies and will replace systems analysts.<br>(e) A modelling method is another name given for a methodology. |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
- 9) In which of the following task(s) of a system development process is/are the role of a Systems Analyst very important?
- |                       |                           |                    |
|-----------------------|---------------------------|--------------------|
| (a) Feasibility study | (b) Requirement Analysis  | (c) Systems Design |
| (d) System Testing    | (e) System Implementation |                    |
- 10) During which phase is the evaluation of the system's actual functionality in relation to expected or intended functionality done?
- |                            |                        |                         |
|----------------------------|------------------------|-------------------------|
| (a) Systems analysis       | (b) Systems designing  | (c) Systems maintenance |
| (d) Systems implementation | (e) Systems Initiation |                         |
- 11) Economic feasibility
- |                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (a) looks at performance aspects of the system.<br>(b) considers how the people feel about the system/project.<br>(c) looks at the financial aspects of the system.<br>(d) is a measure of the cost effectiveness of a project or solution.<br>(e) determines whether the existing system can be upgraded to use a new technology. |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
- 12) Given below are some statements associated with cost-benefit analysis. Identify the correct statement(s) from among them.
- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (a) Cost-benefit analysis is not a key consideration when deciding to proceed with the development of an information system.<br>(b) To analyze economic feasibility, an analyst will itemize benefits and costs.<br>(c) Overheads costs identified during cost benefit analysis include utility costs and building rent.<br>(d) Tangible benefits identified during cost benefit analysis are believed to be difficult or impossible to quantify.<br>(e) Cost benefit analysis is practically possible after identifying the specific requirements and alternate solutions |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

13) A Candidate Systems Matrix

- (a) is a tool used to document similarities and differences between candidate systems.
- (b) does not offer any analysis.
- (c) columns represent characteristics which differentiate the candidates.
- (d) rows represent candidate solutions.
- (e) is a tool used to rank candidate systems.

14) Which of the following is/are correct regarding a Feasibility Analysis Matrix?

- (a) A tool used to rank candidate systems.
- (b) Columns of the matrix represent candidate response.
- (c) Rows of the matrix correspond to the feasibility criteria.
- (d) A cell contains the feasibility assessment notes for each candidate.
- (e) A tool Used to document similarities and differences between candidate systems.

15) Which of the following is a/are document(s) used for fact finding?

- (a) Details of the company owner
- (b) Accounting records
- (c) Customer complaints
- (d) Information systems project requests
- (e) The company's mission statement and plan

16) Which of the following is a/are disadvantage(s) of fact finding through questionnaires?

- (a) The number of respondents is often low.
- (b) There is no guarantee that an individual will answer or expand on all of the questions.
- (c) Questionnaires tend to be inflexible.
- (d) Data gathering through questionnaires may be highly unreliable.
- (e) Responses cannot be tabulated and analyzed quickly.

17) Given below are some statements associated with requirement discovery methods. Identify the correct statement(s) from among them.

- (a) Questionnaires provide a relatively expensive way of fact finding from a large number of individuals.
- (b) A good analyst gets facts initially from existing documentation, forms and files.
- (c) Success of interviews is highly depended on the human relation skills of the systems analyst.
- (d) Observations allow the system analyst to do work measurements.
- (e) Interviews allow a systems analyst to probe for more feedback from the interviewee.

18) Which of the following is/are correct regarding Requirements Analysis?

- (a) Securities, ease-of use and performance are examples of functional requirements.
- (b) System requirement is something that the information system must do or a property that it must have.
- (c) System requirements which specify what the information system must do are frequently referred to as non-functional requirements.
- (d) Non-functional requirement is a property or quality the system must have.
- (e) The process and techniques which a systems analyst uses to identify or extract systems problems and solution requirements from the user community are referred to as requirements discovery.

- 19) Which of the following is/are correct regarding the requirements gathering technique 'Observation of the work environment'?

- (a) It is a technique where the systems analyst either participates in or watches a person perform activities to learn about the system.
- (b) Data gathered based on the observation will not be very reliable.
- (c) This technique can be used to check the validity of data obtained directly from individuals.
- (d) Through observation, the systems analyst can identify tasks which have been missed or inaccurately described by other fact-finding techniques.
- (e) One has to be careful when using this technique as the work being observed may not involve the level of difficulty or volume normally experienced during that time period.

- 20) Which of the following is/are correct regarding Discovery Prototyping?

- (a) An advantage of this technique is that the developers may not need to be trained in the prototyping approach.
- (b) Discovery prototyping serves as a training mechanism for users.
- (c) It allows users and developers to experiment with the software and develop an understanding of how the system might work.
- (d) It is not recommended in cases where the development team is having problems defining the system requirements.
- (e) It is the act of building a small scale representative or working model of the users' requirements in order to discover or verify those requirements.

- 21) Column A contains Joint Requirements Planning participants. A word from Column A has to be matched with the most appropriate phrase from Column B.

	Column A		Column B
(i)	Sponsor	A	is responsible for keeping records pertaining to every thing discussed in the meeting.
(ii)	Facilitator	B	is normally an individual in the top management (not IT or Information system Management).
(iii)	Manager	C	is usually responsible for leading all sessions that are held for a systems project.
(iv)	Scribe	D	approves project objectives, establishes project priorities, approves schedules, costs etc.
(v)	IT staff	E	normally do not speak up unless invited to do so.

The correct matching is

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

**The blanks in the Questions 22 – 26 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) Document Flow Diagram
- (ii) Data Flow Diagram
- (iii) Entity Relationship Diagram
- (iv) Use Case Diagram
- (v) Class Diagram

What is the most appropriate way of filling the blanks?

- 22) ..... is a process model used to show the flow of data through a system and the work or processing performed by the system.

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

- 23) ..... is drawn to identify physical movements of the documents used in the system.

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

- 24) ..... shows the system's object structure.

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

- 25) ..... shows who will use the system and in what ways the user expects to interact with the system.

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

- 26) ..... is a data model utilizing several notations to show data in terms of the entities and relationships described by that data.

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

- 27) Following are some statements associated with data flow diagrams (DFDs). Identify the correct statement(s) from among them.

(a) All processes in a DFD have to be decomposed.
(b) DFDs are used for data modelling.
(c) DFDs are used to represent only functional processing, data stores and data movements between functions.
(d) There are several competing symbol sets for DFDs.
(e) DFDs do not show external data sources and external data sinks.

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

- (i) Open-ended boxes(s)
- (ii) Square(s)
- (iii) Circle(s)
- (iv) Rounded rectangle(s)
- (v) Arrow(s)

In the Gane and Sarson notation of a data flow diagram ...**A**.... show(s) the processes, ....**B**.... show(s) external agents, ....**C**.... represent(s) data flows, ....**D**.... represent(s) data stores and ...**E**.... represent(s) inputs and outputs.

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

- 29) Given below are some statements associated with process modelling. Identify the correct statement(s) from among them.

- (a) Processes on a data flow diagram cannot operate in parallel.
- (b) Looping and branching can be shown in a data flow diagram.
- (c) Single Data flow diagrams might include processes which happen hourly, daily, weekly, yearly and on demand.
- (d) One special type of process model, called a context diagram, illustrates the communication focus from the perspective of the system owners and users.
- (e) It is a technique used to organize and document processes of a system.

- 30) Given below are some statements associated with process modelling. Identify the correct statement(s) from among them.

- (a) Context data flow diagram is a process model used to document the scope for a system.
- (b) A physical data flow diagram is a technical pictorial representation that shows what a system is or does and how the system is physically and technically implemented.
- (c) A logical data flow diagram shows the system independent of any technical implementation.
- (d) Decomposition diagram is a tool used to show the top down functional decomposition and structure of a system.
- (e) Context data flow diagram contains one or more processes.

- 31) Identify the basic concepts that underlie all data models.

- (a) Processes
- (b) Use Cases
- (c) Entities
- (d) Relationships
- (e) Attributes

- 32) Which of the following is/are correct regarding prototyping.

- (a) Principle function of prototyping is to establish the system requirements.
- (b) Through prototyping one will gain a better appreciation of how the final system will look.
- (c) Prototype is generally discarded after testing the interface.
- (d) Prototyping is used to improve requirement definition by involving potential system users.
- (e) Prototyping is not recommended for object oriented systems development.

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

- (a) A Data model should be considered as a living document that will change in response to a change in business.
- (b) A Decomposition diagram is also used with data modelling.
- (c) An Entity Relationship Diagram is an example of a technique used with data modelling
- (d) Data modelling is sometimes called database modelling because a data model is eventually implemented as a database.
- (e) Data modelling is a technique for organizing and documenting data of a system.

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

- (a) Logical processes are work or actions which must be performed no matter how one implements the system.
- (b) Each logical process is (or will be) implemented as one or more physical processes which may include work performed by people.
- (c) In a Data flow diagram, it is possible to have a data flow connected directly from one data store to another.
- (d) A Functional decomposition diagram partitions the system into logical subsystems and/or functions.
- (e) An Event diagram is a data flow diagram for a single event that shows the inputs, outputs and data store interactions for the event.

35) Which of the following is/are correct regarding systems design?

- (a) The main aim of Systems Design is to emphasize the business problem.
- (b) Information systems design is defined as tasks which focus on the specification of a detailed computer based solution.
- (c) Systems design focuses on the technical or implementation concerns of the system.
- (d) A physical data flow diagram is a process model used in systems design to communicate the technical implementation characteristics of an information system.
- (e) Information Engineering is not a systems design approach.

**The blanks in the Questions 36 – 39 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) Entity
- (ii) Compound attribute
- (iii) Data type
- (iv) Degree
- (v) Primary key

What is the most appropriate way of filling the blanks?

36) ..... is a property of an attribute that identifies what type of data can be stored in the attribute.

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

37) ..... is an attribute that consists of other attributes.

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



38) Composite attribute is another name given for .....

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

39) The ..... of a relationship is the number of entities which participate in the relationship.

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

40) Following are some statements associated with modelling. Identify the correct statement(s) from among them.

- |                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------|
| (a) Data models and process models represent different views of the same system and they are interrelated.                       |
| (b) Modellers need to synchronize the different models to ensure consistency and completeness of the total system specification. |
| (c) The linkage between data models and process models is almost universally accepted by all major methodologies.                |
| (d) A Data flow diagram is a technique used in object modelling.                                                                 |
| (e) Unified modelling language is used to code designed objects.                                                                 |

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

- |                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (a) The object modelling technique prescribes the use of methodologies and diagramming notations which are completely different from the ones used for data modelling and process modelling. |
| (b) In the late 80s and early 90s, many different object oriented methods were used throughout the industry.                                                                                 |
| (c) The UML prescribes a method for developing systems.                                                                                                                                      |
| (d) The UML is widely accepted as a standard for object modelling.                                                                                                                           |
| (e) Encapsulation literally means 'many forms', the concept that different objects can respond to the same message in different ways.                                                        |

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

- |                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (a) In data modelling, primary key is a candidate key that will most commonly be used to uniquely identify a single entity instance.                             |
| (b) Cardinality in data modelling is the minimum and maximum number of occurrences of one entity that may be related to a single occurrence of the other entity. |
| (c) Foreign key in data modelling is a primary key of an entity that is used in another entity to identify instances of a relationship.                          |
| (d) A decomposition diagram is a planning tool for more detailed process models, namely data flow diagrams.                                                      |
| (e) In a data flow diagram, it is legal to have a data flow between a data store and an external entity.                                                         |

43) Consider the following tools

- (i) Oracle's Designer 2000
- (ii) Rational ROSE
- (iii) Microsoft's Visual Studio.NET

Which of the above is/are considered as CASE tools?

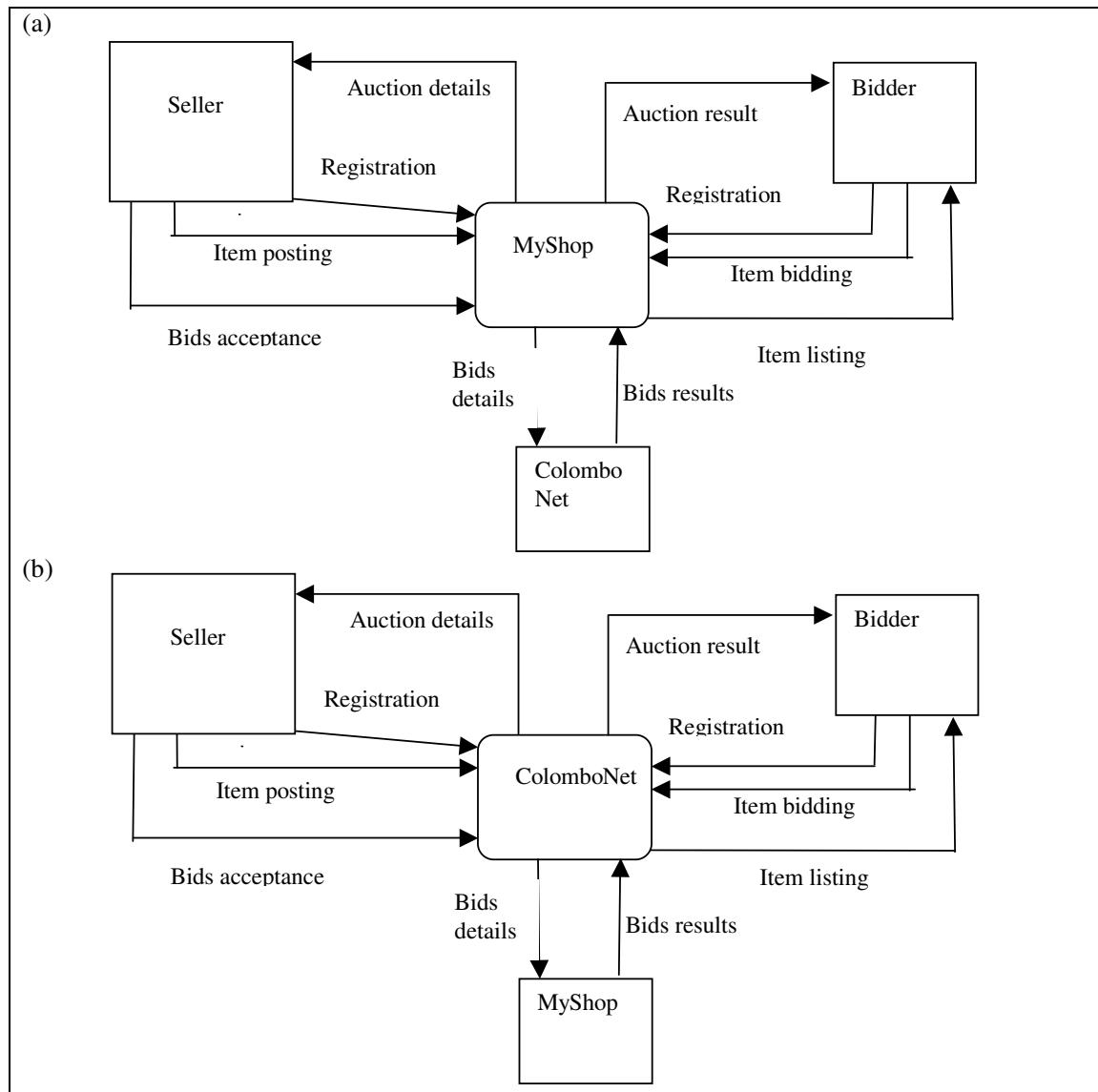
- |                        |                       |                         |
|------------------------|-----------------------|-------------------------|
| (a) Only (ii)          | (b) Only (i) and (ii) | (c) Only (ii) and (iii) |
| (d) Only (i) and (iii) | (e) All               |                 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

Consider the following CASE study for **question 44-46**.

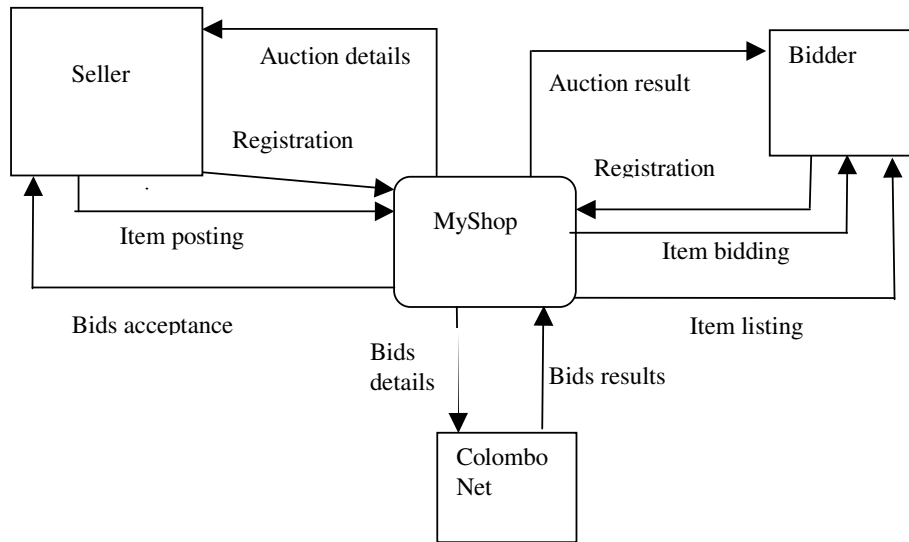
ColomboNet System, one of the major Internet service providers, has decided to develop and launch portals as part of their diversification process. In the first of such portals, ColomboNet has identified a portal known as MyShop dedicated to online auctioning. It will provide a fast and convenient way to connect buyers and sellers through an Internet based on-line auctioning forum.

The portal is designed to benefit both bidders and sellers. The portal must provide a channel for connecting buyers and sellers through an online auctioning forum. The services provided by MyShop portal enable sellers to show case their products, on which the users will place their bids through the portal. The seller will post details of items and specifies the reserved price for each item. ColomboNet will charge the seller based on the dimension of the web page. The page will be on-line for the period agreed upon by the seller, after which the seller, if required, can renew it. In the beginning the portal will only facilitate in accepting bids and pass on to the seller. Once the seller decides and accepts the bid, the results are displayed back on the site with necessary details of bids placed. ColomboNet system is involved in the actual transactions between buyers and sellers.

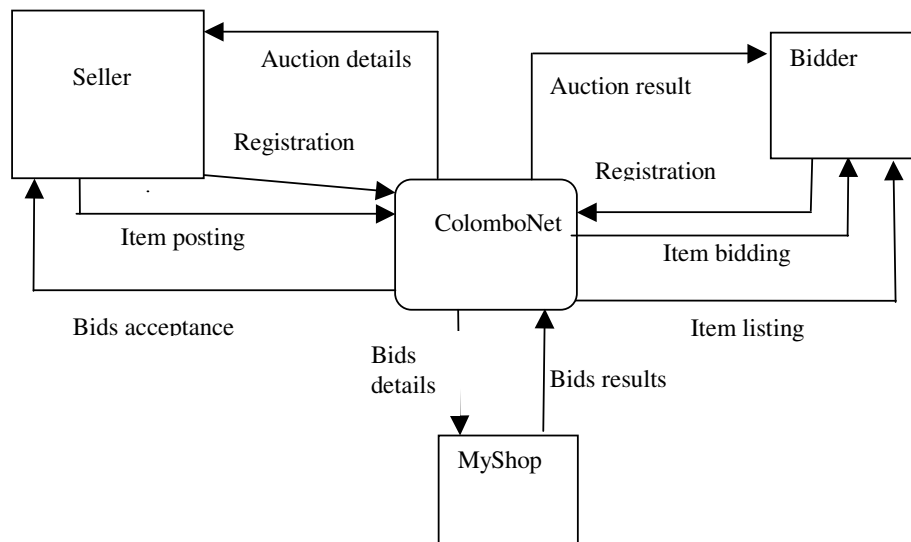
44) Identify the correct Context Diagram for the System.



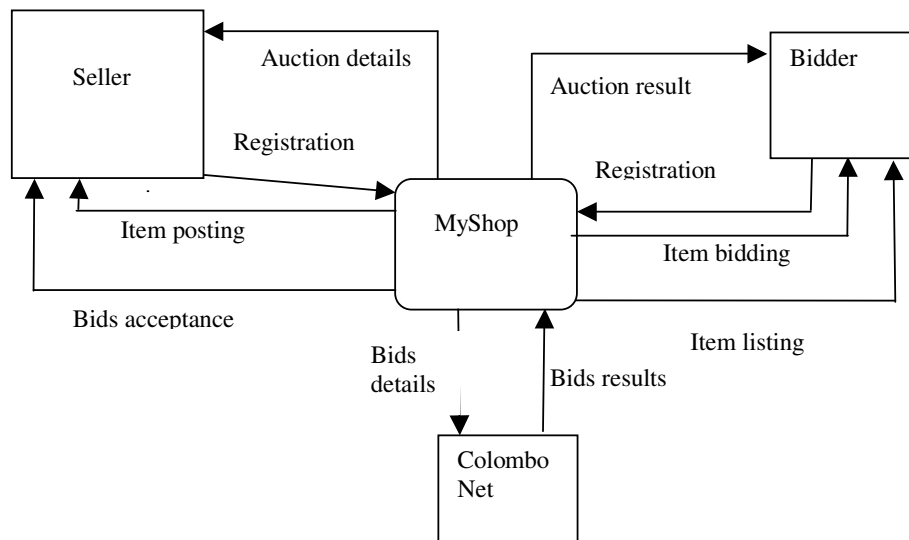
(c)



(d)



(e)



45) Based on the context diagram, the requirement specification was worked out for the MyShop portal. Identify the processes to be covered.

- |                   |                        |                  |
|-------------------|------------------------|------------------|
| (a) Stock Control | (b) Registration       | (c) Item Posting |
| (d) Bidding       | (e) Auction Management |                  |

46) Identify the possible external entities for the system.

- |             |            |                |
|-------------|------------|----------------|
| (a) Seller  | (b) Bidder | (c) ColomboNet |
| (d) My shop | (e) Stocks |                |

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

- |                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| (a) Physical Process Models are typically constructed as deliverables of the requirements analysis phase of a project.                                  |
| (b) Logical process models are concerned with implementation details or technology.                                                                     |
| (c) A Physical process model describes the business processing requirements of the system which does not focus on the technical solution.               |
| (d) During system design, the logical process model will be transformed into a physical process model for the chosen technical architecture.            |
| (e) A series of formal Structured English statements can be used effectively to communicate processing rules of elementary processes in process models. |

48) Which of the following is/are correct regarding Project Management or Process Management?

- |                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------|
| (a) Project Management is necessary to ensure that the project meets deadlines.                                               |
| (b) Process Management is necessary to ensure that the project meets deadlines.                                               |
| (c) Project Management is not necessary to ensure that the project is developed within an acceptable budget.                  |
| (d) Process management is the activity of documenting, managing and continually improving the process of systems development. |
| (e) Project Managers use PERT charts to show projects tasks and the relationship between these tasks.                         |

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

- |                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (a) 'Microsoft Project' is an example of a project management software.                                                                                                            |
| (b) A Gantt chart is a graphical network model used to show the interdependencies between projects tasks.                                                                          |
| (c) A PERT chart is a bar chart used to show the tasks of a project against a calendar.                                                                                            |
| (d) A Gantt chart is commonly used for projects scheduling and progress evaluating.                                                                                                |
| (e) Gantt charts are more effective for project scheduling and progress evaluation whereas PERT charts are more effective when one wants to study the relationships between tasks. |

50) Which of the following is/are correct regarding Automated tools and technology?

- |                                                                                                          |
|----------------------------------------------------------------------------------------------------------|
| (a) They improve productivity through automation of tasks.                                               |
| (b) They improve quality because automated tools check for completeness, consistency and contradictions. |
| (c) They provide better and more consistent documentation.                                               |
| (d) They do not support the requirement analysis phase of the system development life cycle.             |
| (e) They reduce lifetime maintenance.                                                                    |

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