



UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)
Academic Year 2017 – 1st Year Examination – Semester 2

IT2405: Systems Analysis and Design
Multiple Choice Question Paper

12th November 2017

(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 **14 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 a Management Information System (MIS)?
- (a) A Sales trend forecasting information system which is developed to prepare five year sales forecasts, is an example for an MIS.
 - (b) Before starting to develop an MIS it is required to identify business processes of the business.
 - (c) Businesses should look into the possibility of buying a large number of Personal computers and a Local area network as the starting point of developing an MIS.
 - (d) An MIS uses transaction data to produce information needed to run the business.
 - (e) An MIS primarily serves the functions of planning, controlling and decision making at the management level.
- 2) Which of the following user categories can be considered as system stakeholder(s) for an information system?
- (a) Business analysts.
 - (b) Business partners of an organizations.
 - (c) Technical and professional staff of an organization.
 - (d) System users such as clerical and service workers.
 - (e) Suppliers of an organization.
- 3) Legacy systems are considered to be systems which are,
- (a) used to solve legal issues of an organization.
 - (b) easily replaceable by modern software solutions.
 - (c) difficult to maintain due to inadequate system documentation.
 - (d) outdated software systems that rely on obsolete programming languages.
 - (e) used to manage the business processes that are outsourced to another business organization.
- 4) Identify the correct statement(s) associated with an architecture based classification of Information Systems.
- (a) A file-server architecture is a multi-tiered solution in which the presentation and presentation logic layers are implemented on the client side.
 - (b) A server computer hosts only the data layer in a File server architecture.
 - (c) Component based architecture is an example for a distributed system architecture.
 - (d) Security is easier since there is only one central repository of data and applications in server based architecture.
 - (e) Security is stronger in client-server architecture since there is only one central computer.
- 5) Which of the following is/are true of the sequential development approach for software development?
- (a) It is best suited for projects where the requirements can be clearly defined.
 - (b) It allows versions of usable information to be delivered in regular and shorter time frames
 - (c) It does not maintain any documentation.
 - (d) It has a rigid process which is less flexible.
 - (e) Physical design activities are not carried out in it.

- 6) Consider the following statements.
- The most important part of the system is delivered first, and then the other parts of the system are delivered according to their priority.
 - Each iteration does some analysis, some design, and some development.
 - 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 statement(s) is/are correct regarding Iterative system development approach?

- | | | |
|-------------------------|--------------------------|------------------------|
| (a) (i) only. | (b) (ii) 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 methodology?

- | |
|---|
| (a) It uses a problem solving approach to develop the system. |
| (b) It divides the lifetime of an information system into two stages namely; System development and Systems analysis. |
| (c) It executes the system development stage of the system life cycle. |
| (d) It is a process that defines a set of activities related to system development. |
| (e) It is a process used by analysts and programmers to design systems. |

- 8) The scope definition phase is the first phase of the classic systems development process. Which of the following is/are included in scope definition?

- | |
|--|
| (a) The areas of a business that a project may or may not address. |
| (b) The business processes in the system. |
| (c) The government regulations (if any) that should be followed. |
| (d) The project worthiness. |
| (e) Opportunities which would bring more benefits to the organization. |

- 9) Which of the following is/are a context diagram used for?

- | |
|---|
| (a) Specifying system inputs and system outputs. |
| (b) Building the information system. |
| (c) Analyzing how the system interacts with its environment. |
| (d) Determining the causes and effects associated with the system. |
| (e) Identifying the business transactions to which the information system should respond. |

- 10) Consider the following statements.

- Fact finding is a technique used throughout the system development process.
- System models and prototypes should be validated for completeness and correctness.
- The deliverable of the logical design phase is known as a business requirements statement.

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)	Project scope	A	Characteristics of the proposed system.
(ii)	Non-functional requirements	B	A substitute for interviews.
(iii)	Logical Design	C	Fact finding technique.
(iv)	Joint Requirements Planning	D	Illustrates data structures, business processes, data flows and user interfaces.
		E	The aspects of a business that will or will not be included in the project

- (a) (i) - E, (ii) - A, (iii) - D, (iv) - B
 (b) (i) - D, (ii) - E, (iii) - B, (iv) - C
 (c) (i) - E, (ii) - A, (iii) - D, (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. What is / are the key expectations of feasibility?

- (a) To measure how well a solution meets the identified system requirements.
 (b) To measure the availability of technical resources and expertise.
 (c) To determine whether the deadlines are mandatory or desirable
 (d) To measure the profitability of the solution.
 (e) To understand the potential legal and contractual ramifications of the system.

- 13) Consider the following questions used to elicit requirements.
- What is the acceptable throughput rate?
 - Are there any duplicate steps in the process that must be eliminated?
 - Should the access to the system or information be controlled?

Identify the requirement category to which the above questions i-iii fall.

- (a) (i) – Efficiency; (ii) – Safety ; (iii) – Security
 (b) (i) - Efficiency; (ii) – Performance; (iii) – Service
 (c) (i) – Performance; (ii) – Efficiency; (iii) – Security
 (d) (i) – Economy; (ii) – Efficiency; (iii) – Service
 (e) (i) – Service; (ii) – Performance; (iii) – Security

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

	Column X		Column Y	
(i)	Accurate	A	The requirements are defined so that they can be demonstrated during testing.	
(ii)	Consistent	B	The requirements should truly fulfill the purpose of the system.	
(iii)	Traceable	C	The requirements should directly map the features of the system.	
(iv)	Verifiable	D	The requirements are not ambiguous.	
(v)	Complete	E	The requirements should define all possible inputs and responses.	
		F	The requirements are stated precisely.	

- (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) Consider the following questions.

- (i) You are not going to use this function, are you?
 (ii) Do you have to have both these columns on this report?
 (iii) Do you think special car seats should be required for infant passengers?

Which of the above questions **should be avoided** when preparing a good questionnaire?

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

- 16) Which of the following statements is / are correct regarding the requirement definition document?

- (a) It does not contain constraints of the information system.
 (b) Information about other systems with which the system must interface should also be included in this document.
 (c) It is also known as functional specification.
 (d) System coding should be included in this document.
 (e) It is a formal document that communicates the requirements of a proposed system to key stakeholders.

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

- | |
|---|
| (a) Joint requirement planning.
(b) Observations.
(c) Rapid Application Development.
(d) Sampling of existing development.
(e) Prototyping. |
|---|

18) Which of the following is/are **NOT** a component shown in Data Flow diagrams?

- | | | |
|-----------------------|-----------------|------------|
| (a) Processes | (b) Data stores | (c) Actors |
| (d) External entities | (e) Data flows | |

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

- (i) A process in a DFD can enter data to a data store or can retrieve data from a data store.
- (ii) External entities are components outside the system which uses the system output but does not input data to the system.
- (iii) Data flows between two processes or between two data stores can be modelled in the DFD.

Identify the correct statement(s) from the above.

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

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

- | |
|--|
| (a) They are implementation dependent models.
(b) They are 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) They ease the communication with the end users. |
|--|

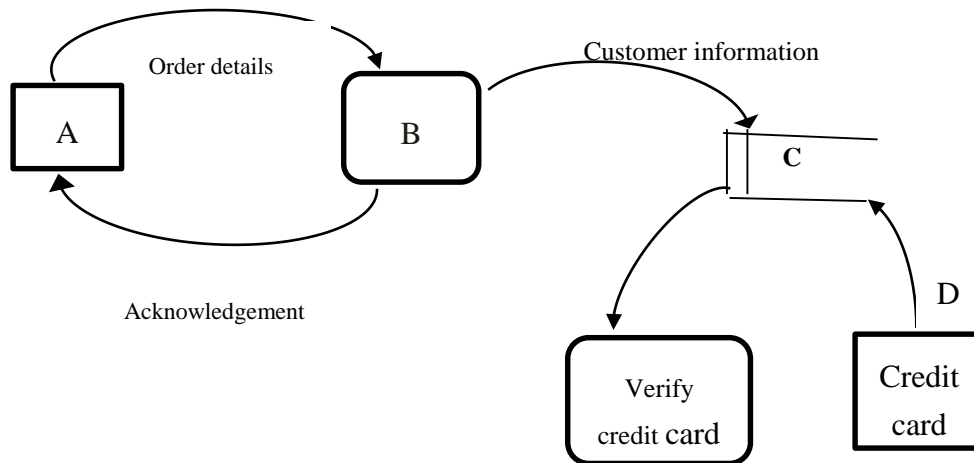
21) Identify the class(es) in a Hotel Reservation system from among the following.

- | | | |
|-----------------|-------------------|------------------|
| (a) Reservation | (b) Hotel address | (c) Receptionist |
| (d) Room number | (e) Room | |

22) Which of the following most correctly describe(s) the Object oriented concept of Encapsulation?

- (a) Methods or attributes defined in an object class can be inherited by another objects class.
- (b) An object's attributes can be accessed or changed only through that object's specific behaviors.
- (c) An object's attributes can be accessed or changed only through another object's specific behaviors.
- (d) An object's attributes can be accessed or changed only through it's supertype object's specific behaviors.
- (e) Methods or attributes defined in an object class cannot be inherited by another objects class.

23) Part of the DFD diagram of an Online Ordering System is shown below.



Identify A-D from among the following.

- i. Process order
- ii. Customer Details
- iii. Credit card and order details
- iv. Customer

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

24) Consider the following diagram.

i.



ii.



iii.



iv.



Identify the legal and illegal data flows from i. to iv above. Hint. Arrows show the directions of the data flow.

(a)	i. Legal	ii. Illegal	iii. Legal	iv. legal
(b)	i. Legal	ii. Legal	iii. Legal	iv. legal
(c)	i. Legal	ii. Illegal	iii. Legal	iv. legal
(d)	i. Legal	ii. Illegal	iii. Illegal	iv. legal
(e)	i. Legal	ii. Legal	iii. Legal	iv. legal

25) Consider the format of a decision table used in modelling business policies given below.

	C1	C2	C3	C4
R1				
R2				
R3				
R4				
R5				
R6				

Identify the correct statement(s) related to rows and columns given as R1-R6 and C1-C4 in the above table.

- (a) C1 to C4 are Rules.
- (b) R1 to R4 are Conditions.
- (c) R5 to R6 are Actions.
- (d) R1 to R6 are Characteristics of the system.
- (e) C1 to C4 are candidate system solutions.

26) Match column X with column Y.

Column X			Column Y
(i)	Functional decomposition diagram	A	is a diagram that shows only the system's main interfaces with its environment.
(ii)	Object diagram	B	Used to organize and document system's processes.
(iii)	Context dataflow diagram	C	shows the systems object structure.
(iv)	Class diagram	D	provides the developer with a snapshot of the system's objects at one point in time.
(v)	Process models	E	is drawn to partition the system into logical subdivisions and/or functions.

- (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. A Country and a Region
- ii. A School and it's Teachers
- iii. A Polygon and it's Line segments
- iv. An Account and a Savings account
- v. A Building and it's Rooms

Identify the option(s) giving the most appropriate type of relationships to model the above relationships.

(a) i. Aggregation	ii. Association	iii. Composition	iv. Inheritance	v. Composition
(b) i. Composition	ii. Association	iii. Composition	iv. Inheritance	v. Aggregation
(c) i. Aggregation	ii. Association	iii. Composition	iv. Association	v. Association
(d) i. Aggregation	ii. Association	iii. Aggregation	iv. Inheritance	v. Inheritance
(e) i. Aggregation	ii. Association	iii. Association	iv. Inheritance	v. Aggregation

28) Consider the following scenario.

In some types of accounts, interest is computed as a percentage of the average daily balance during a month. In other types of accounts, interest is computed as a percentage of the minimum daily balance during a month. In a mortgage account, interest is computed as a percentage of the balance at the end of the month.

What is/are the most appropriate Object Oriented term(s) to describe the above scenario?

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

29) Consider the following statements in relation to Entity Relationship Diagram modelling.

- (i) In an Information System where a Supervisor is an Employee, there can be a recursive relationship between the Employee and Supervisor.
- (ii) An associative entity inherits its primary key from more than one other entity.
- (iii) Relationships can occur only between two different entities.

Which of the following statement(s) is/are correct?

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

Consider the following list of terms in answering the questions from 30-31.

- i. Generalization
- ii. Nonidentifying
- iii. Subtype
- iv. N-ary
- v. Associative entity

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

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

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

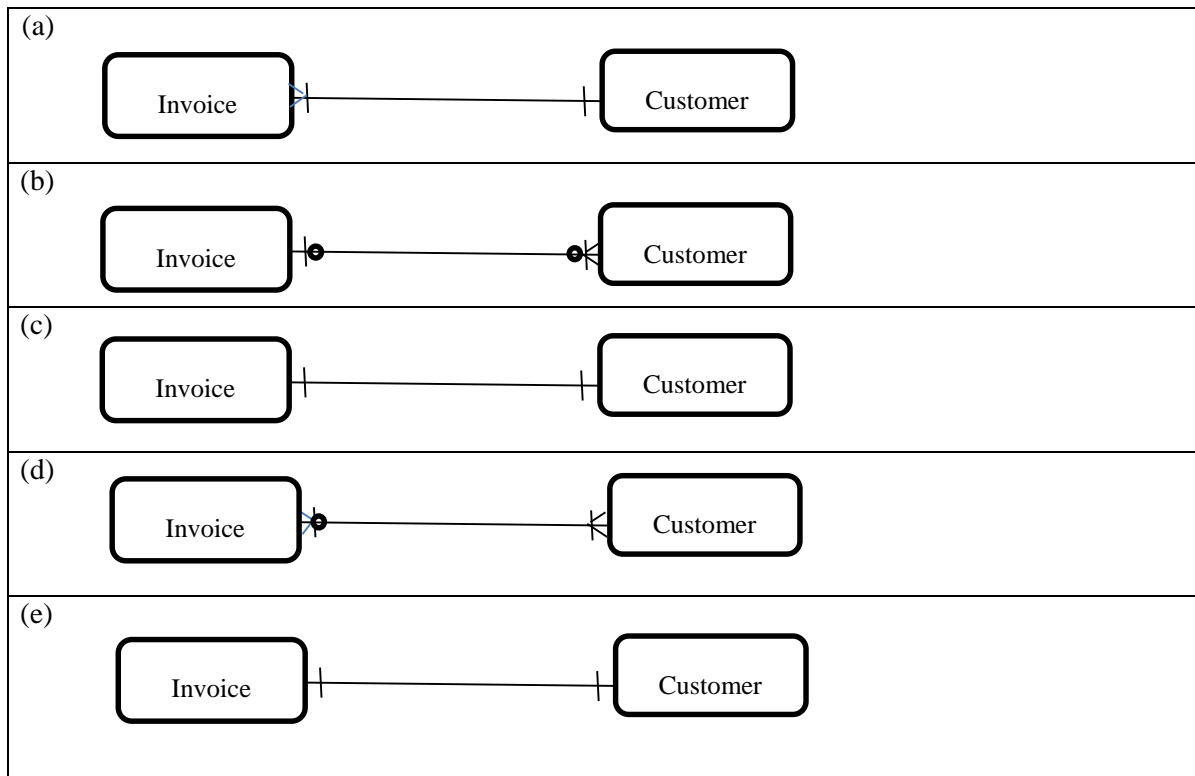
31) Inrelationships each participating entity has its own independent primary key.

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

32) Consider the following scenario.

“An invoice is sent to one customer but there can be many invoices sent to the same customer”

Identify the correct Entity Relationship Diagram modelling the above scenario.



33) Consider the following statements related to Employee entity in an Entity Relationship Diagram drawn for a Company Management Information System.

- (i) Employee_No. and National_Id_No are candidate keys.
- (ii) Employee_No. can be the primary key.
- (iii) Department_Id can be a foreign key in the employee table in a relationship with Department entity.

Which of the above statements is/are correct ?

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

34) Identify the correct statement(s) related to the task of ‘Identifying candidate solutions’ in ‘Decision analysis phase’ of systems analysis.

- | |
|---|
| (a) This is the second task listed under the Decision analysis phase. |
| (b) System owners and users are directly involved in identifying candidate solutions. |
| (c) Constructing a ‘Candidate systems matrix’ is useful in this task. |
| (d) Systems analyst, system designers and developers are involved in this task. |
| (e) The task is followed by the task ‘Update project plan’. |

35) Feasibility should be measured throughout the life cycle of a software project. Identify the system analysis phases(s) which involve(s) feasibility checkpoint from among the following.

- | | |
|------------------------------|-----------------------|
| (a) Scope definition | (b) Problem analysis |
| (c) Requirements analysis | (d) Decision analysis |
| (e) Construction and testing | |

36) The measure of how well a proposed system meets the identified system requirements to solve the problems is referred as,

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

37) What is meant by technical feasibility?

- | |
|---|
| (a) Availability of technology for the defined solution. |
| (b) Applicability of state-of-the-art technology for the defined problem. |
| (c) Availability of the skills required to apply the new technology. |
| (d) How well the proposed system satisfies the system requirements identified in the requirements analysis phase. |
| (e) Affordability of the new technology. |

38) Which of the following is/are true about the Feasibility analysis matrix?

- | |
|--|
| (a) It is used to rank candidate systems. |
| (b) It is same as candidate systems matrix. |
| (c) Candidate solutions in it are same as candidate system matrix. |
| (d) It includes operational feasibility as a feasibility criteria. |
| (e) It uses weightings to quantify each criteria. |

39) Which of the following statements is/are true regarding system design approaches?

- | |
|---|
| (a) Prototyping always leads to creative solutions. |
| (b) Object oriented design is an example for the model driven design approach. |
| (c) Structured design is a data oriented design approach. |
| (d) Prototyping always accelerates the development life cycle. |
| (e) Rapid application development merges structured and prototyping techniques. |

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

- | | |
|-------------------------|------------------------------------|
| (a) Structured design. | (b) Rapid application development. |
| (c) Spiral development. | (d) Object-oriented design. |
| (e) Prototyping. | |

- 41) Consider the following statements related to Distributed and Centralized systems.
- (i) In a distributed system the components of an information system are distributed to multiple computers.
 - (ii) A centralized system is more complex and more difficult to implement than a distributed system.
 - (iii) Most legacy systems are centralized systems.

Which of the above statements is/are correct?

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

- 42) Which of the following is/are true in a client/server architecture?

- | |
|--|
| (a) A thin client acts only as a terminal.
(b) It is a type of distributed system architecture.
(c) A server can be any device with embedded processes that can connect to the network.
(d) A web server hosts application logic and services for an information system.
(e) An application server hosts internet or intranet web sites. |
|--|

- 43) Identify database servers from among the following.

- | | | |
|----------|------------|-----------|
| (a) SQL | (b) Oracle | (c) CORBA |
| (d) HTML | (e) DB2 | |

- 44) Consider the following paragraph containing blanks.

A ...i..... is a set ofii..... computers connected to one or more ...iii.....computers through either cable or wireless connections over relatively ...(iv).... distances.

Fill in the blanks with the appropriate set of words.

- | | | | |
|------------|------------|-------------|-----------|
| (a) i. WAN | ii. server | iii. client | iv. short |
| (b) i. LAN | ii. server | iii. client | iv. long |
| (c) i. LAN | ii. client | iii. server | iv. short |
| (d) i. WAN | ii. client | iii. server | iv. short |
| (e) i. LAN | ii. client | iii. server | iv. long |

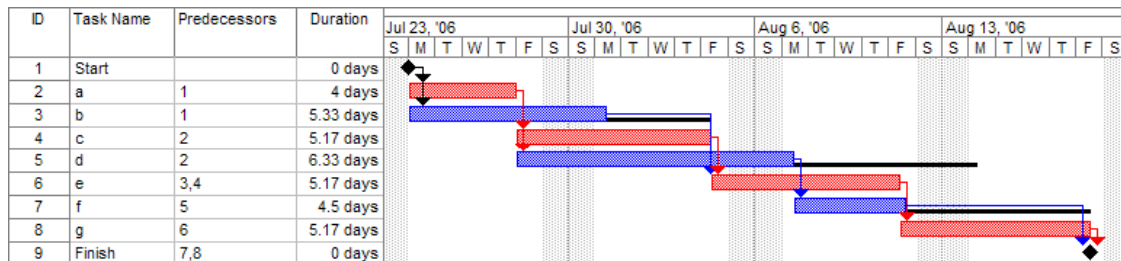
- 45) Which of the following is/are **NOT** success factor(s) of a project from a project management perspective?

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|---|
| (a) Delivered on time
(b) Delivered within budget
(c) Acceptable to the customer
(d) Minimum number of errors
(e) Reusable design |
|---|

46) Project management tasks do **NOT** include,

- (a) scheduling all project activities.
- (b) estimating the project tasks for time, cost and resources.
- (c) assessing successes and failures of a project.
- (d) requirements elicitation and analysis.
- (e) validating functional requirements.

47) Consider the image shown below.



What is shown in the above image?

- (a) Gantt chart
- (b) PERT chart
- (c) DFD diagram
- (d) Feasibility analysis matrix
- (e) Flow chart

48) Identify the competencies of good project managers from among the following.

- (a) Interpersonal awareness.
- (b) Monitoring and controlling
- (c) Communication skills
- (d) Conceptual thinking
- (e) Business awareness

49) CASE tools are used to,

- (a) reverse engineer a poorly designed system into a workable model.
- (b) generate user specific requirements.
- (c) automate information systems development.
- (d) analyze the code for correctness.
- (e) generate code.

50) Which of the following facilities does the Application Development Environment tools provide?

- (a) Version controlling.
- (b) Compiling.
- (c) Source code editing.
- (d) Testing.
- (e) Help authoring.
