UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)
Academic Year 2019 – 2nd Year Examination – Semester 3

IT3105 – Object Oriented Analysis & Design
Part 1 - Multiple Choice Question Paper

29th June, 2019
(ONE HOUR)

Important Instructions:

- The duration of the paper is **1 (one) hour**.
- The medium of instruction and questions is English.
- The paper has **30 questions** and **9 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.**
- Calculators are **not** allowed.
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1) Which of the following statements is/are correct regarding Polymorphism?

(a) It is a mechanism to reduce and filter out details so that one can focus on a few concepts at a time.
(b) It allows different forms of the same service to be defined.
(c) It is a method to hide its operations from other objects.
(d) It defines the data that represents characteristics of interest about an object.
(e) It is the packaging of several items together into one unit and protecting its content.

2) _____ is a technique wherein the attributes and behaviors common to several types of object classes are grouped/abstracted into their own class called a supertype.

(a) Polymorphism	(b) Generalization	(c) Multiplicity
(d) Encapsulation	(e) Abstraction	

3) Which of the following statements is/are correct regarding UML diagrams?

(a) Class diagrams address the static view of the system.
(b) Use-Case diagrams Illustrate how messages are sent and received between objects and in what sequence.
(c) Composite structure diagrams decompose the internal structure of a class.
(d) Activity diagrams combine a number of classes or components into a subsystem.
(e) Package diagrams describe a lightweight extension mechanism to the UML by defining custom stereotypes, tagged values, and constraints.

4) Which of the following statements is/are correct regarding the Rational Unified Process (RUP)?

(a) Requirements are mainly identified in the Elaboration phase.
(b) Inception, Elaboration, Construction and Transition are the four phases of RUP.
(c) UML is not an important aspect of the RUP.
(d) RUP is an iterative process.
(e) Testing is mainly carried out in the transition phase.

5) Consider the following statements with regard to the Software Development Processes.

I. The waterfall model is mostly used for large systems engineering projects where a system is developed at several sites.
II. The cost of accommodating changing customer requirements is reduced when incremental models are used for the software development process.
III. Agile is applicable if the software company is developing a small or medium-sized product for sale.

Which of the above statements is/are correct?

(a) (I) Only.	(a) (II) Only.	(b) (I) and (II) Only.
(c) (II) and (III) Only.	(d) (I), (II) and (III).	

6) Consider the following statements with regard to Use-Case Diagrams.

I. They represent the functionality provided by the system.
II. They should be used when the system has many interfaces.
III. They provide a snap shot of the system's object at one point in time.

Which of the above statements is/are correct?

(a) (I) Only.	(b) (II) Only.	(c) (I) and (III) Only.
(d) (I) and (II) Only.	(e) (I), (II) and (III).	

7) Which of the following is/are regarded as types of Actors in Use-Case Modeling?

(a) Primary System Actors.
(b) Primary Business Actors.
(c) Secondary Business Actors.
(d) External System Actors.
(e) External Receiver Actors.

8) Which of the following is/are correct regarding Relationships in Use-Case Modeling?

(a) The extension use case extends the functionality of the original use case.
(b) <include> explicitly incorporates the behavior of another use case.
(c) <depends on> shows the relationship between use cases indicating that one use case cannot be performed until another use case has been performed.
(d) The inheritance relationship cannot be displayed in use-case diagrams
(e) <extend> is the relationship between the abstract use case and use case that uses it

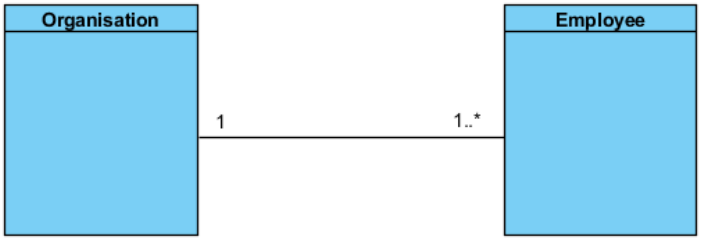
9) Consider following statements regarding Generalization in Use-Case diagrams.

I. Child use-cases can add new features.
II. Child use-cases cannot override the parent use case.
III. Actor generalization factors out behavior common to two or more actors into a parent actor.

Which of the above statements is/are correct?

(a) (I) Only.	(b) (II) Only.	(c) (I) and (II) Only.
(d) (I) and (III) Only.	(e) (I), (II) and (III).	

10) Consider the following diagram.



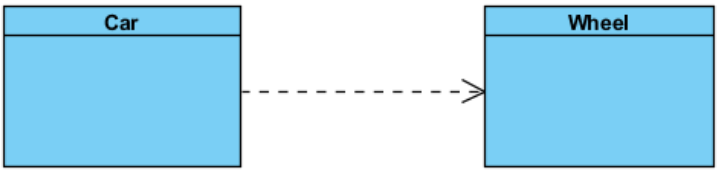
Select correct statement(s) regarding the above diagram.

(a) An organisation can have zero employees
(b) Some employees do not belong to any organisation
(c) An organisation has one or more employees
(d) Employees can work in multiple organisations
(e) Employee only works for one organisation

11) Which of the following is/are correct regarding Inheritance in UML Class Diagrams?

(a) A super-class inherits all attributes, operations, and relationships that are defined for all of its sub-classes.
(b) It provides the capability to create a hierarchy of classes.
(c) Common structure and behavior are shared among classes.
(d) The descendants are called parent classes
(e) The descendants are called child classes

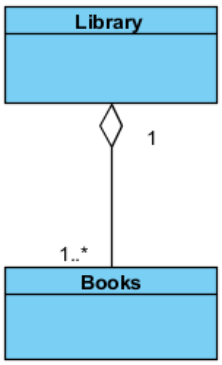
12) Consider the following diagram.



The relationship between Car and Wheel in the above diagram is,

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

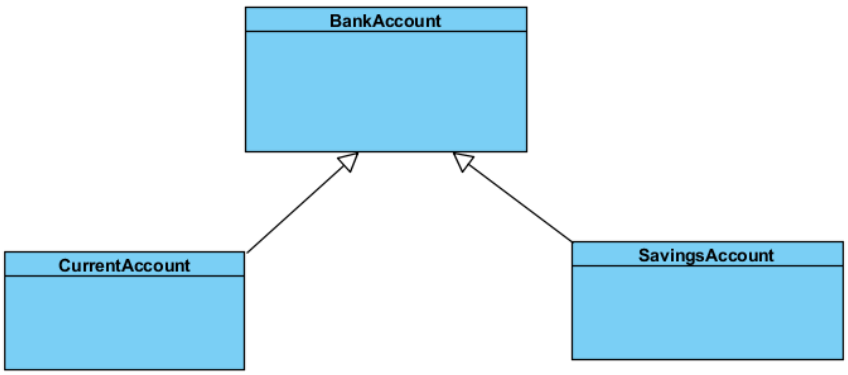
13) Consider the following diagram.



The relationship between Library and Books in the above diagram is,

(a) Abstraction	(b) Inheritance	(c) Dependency
(d) Composition	(e) Aggregation	

14) Consider the following diagram.



The relationship between BankAccount, CurrentAccount and SavingsAccount in the above diagram is,

(a) Composition	(b) Inheritance	(c) Abstraction
(d) Encapsulation	(e) Dependency	

15) Which of the following is/are correct regarding types of Object Classes in Object-Oriented Design (OOD)?

(a) Entity class is an object-oriented class that contains business related information.

(b) Control class is an object class that contains application logic.

(c) Persistence class is an object class that handles operating system specific functionality.

(d) System class is an object class that provides functionality to read and write attributes in a database.

(e) Entity class is an object class that provides the means by which an actor can interface with the system.

16) Consider following statements regarding "Coupling and Cohesion" in Object-Oriented Design (OOD).

I. Coupling is the degree to which one class is connected to or relies upon other classes.
II. Cohesion is the degree to which the attributes and behaviors of a single class are related to each other.
III. Low Coupling and High Cohesion is beneficial for object-oriented design.

Which of the above statements 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).	

17) Which of the following is/are correct regarding types of Design Patterns in Object-Oriented Design (OOD)?

(a) Creational patterns deal with initializing and configuring classes and objects.
(b) Structural pattern deal with dynamic interactions among societies of classes and objects.
(c) Behavioral patterns deal with decoupling interface and implementation of classes and objects.
(d) Singleton Pattern is a type of Creational design pattern.
(e) Adapter Pattern is a type of Behavioral design pattern.

18) Consider the following statements regarding State Diagrams in Object-Oriented Design (OOD).

I. State Diagrams are created only for classes with significant dynamic behavior.
II. They only help designers to understand the behavior of the objects in the system.
III. They prevent guesswork regarding object behavior.

Which of the above statements is/are correct?

(a) (I) Only.	(b) (II) Only.	(c) (I) and (II) Only.
(d) (I) and (III) Only.	(e) (I), (II) and (III).	

19) Consider following statements regarding State Transitions of State Diagrams used in Object-Oriented Design (OOD).

I. A state transition represents a change from an originating state to a successor state.
II. A state transition diagram consists of two special states called Start State and Stop State.
III. A state transition may also trigger an event such as a message being sent to another object in the system.

Which of the above statements is/are correct?

(a) (I) Only	(b) (II) Only	(c) (III) Only
(d) (I) and (II) Only	(e) (I), (II) and (III).	

20) Which of the following is/are correct regarding Sub States of State Diagrams used in Object-Oriented Design (OOD)?

(a) Sub states come in two varieties: Sequential and Concurrent.
(b) Sub states reside within a state.
(c) Sequential sub states proceed at the same time.
(d) Concurrent sub states occur one after the other.
(e) A dotted line separate concurrent sub state.

21) Consider the following diagrams in UML.

I. State Chart Diagram.
II. Activity Diagram.
III. Collaboration Diagram.

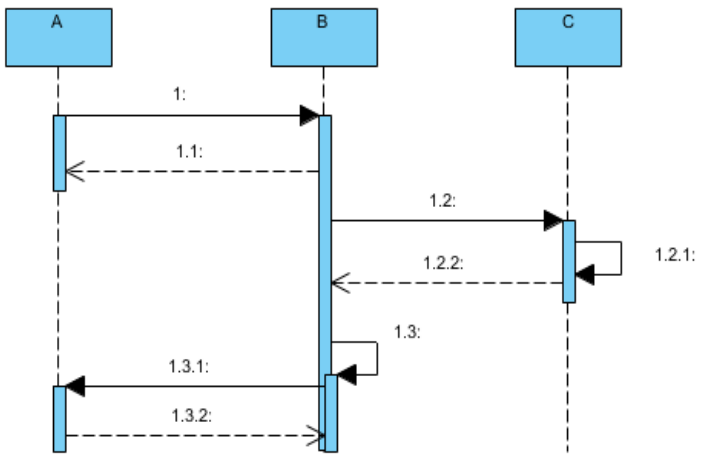
Which of the above diagrams is/are considered as interaction diagrams?

(a) (II) Only. (b) (III) Only. (c) (I) and (III) Only.
(d) (I) and (II) Only. (e) (I), (II) and (III).

22) Which of the following statements is/are correct regarding sequence and collaboration diagrams?

(a) Collaboration diagrams can be used to represent both Synchronous and Asynchronous messages.
(b) Sequence and collaboration diagrams are categorized under dynamic diagrams.
(c) Collaboration diagrams can be read from top to bottom.
(d) Multiplicity is used in sequence diagrams to number the messages.
(e) The sequence in which the messages are flowing between objects can be shown in both sequence and collaboration diagrams.

Consider the following diagram drawn in UML and answer questions 23 and 24.



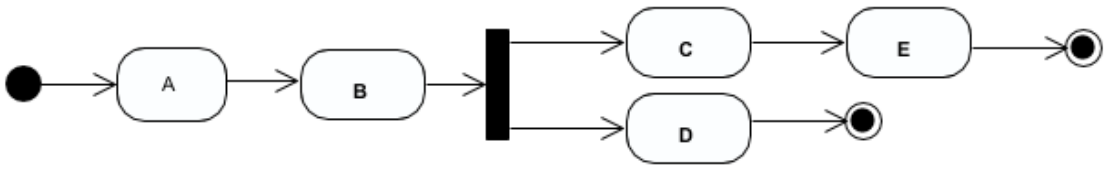
23) The diagram drawn above is an example for a

(a) static diagram.	(b) dynamic diagram.	(c) communication diagram.
(d) collaboration diagram.	(e) interaction diagram.	

24) Which of the following combinations of notations is/are used to draw the above diagram?

(a) Swim lanes, Synchronous messages, Boundary class and focus of control.
(b) Triggers, Asynchronous messages, Objects and Recursive messages.
(c) Object lifeline, Asynchronous messages, Return Messages and Sub activity indicators.
(d) Synchronous messages, Self-messages, Object lifeline and Return messages.
(e) Asynchronous messages, Recursive messages, Objects and Focus of control.

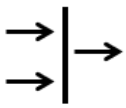
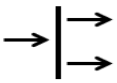
25) Consider the following diagram.



Which of the following activity sequences is/are possible in an execution of the above activity diagram?

(a) A→B→D	(b) A→B→C→E	(c) C→D→E
(d) A→B→D→C→E	(e) A→B→E	

26) Match the notation in Column A with the correct description in Column B.

Column A	Column B
(i) 	A. Fork node
 (ii)	B. Merge node
(iii) 	C. Decision node
(iv) 	D. Join Node

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

27) Which of the following statements is/are correct regarding UML activity diagrams?

(a) A final flow node, shows the finish of an activity without terminating other sequence of activities.
(b) A communication node is an element of UML activity diagrams.
(c) An exception activity can be used to show an interrupting activity in an activity diagram.
(d) In an activity diagram one should use only one bull's eye symbol.
(e) Activity diagrams are similar to flow charts.

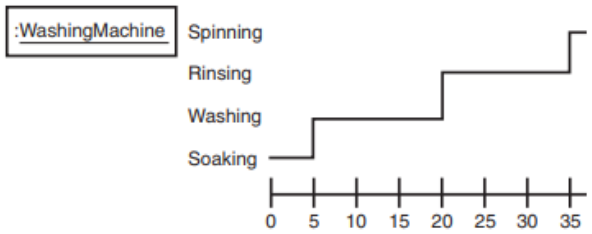
28) Component diagrams are used to model the physical aspects of a system. Which of the following is/are visualized in a component diagram?

(a) Files used in a system. (b) Servers. (c) Storage devices.
(d) Executable files (.exe) (e) Library files.

29) Which of the following statements is /are correct regarding different UML diagrams?

(a) A profile diagram uses stereotypes, tagged values and constraints to model the system.
(b) An interaction overview diagram can be drawn when one replaces activities in an activity diagram using sequence diagrams or communication diagrams.
(c) One should use all available UML diagrams to model/design the system.
(d) Deployment diagram is another name used to represent a component diagram.
(e) In a deployment diagram a node is represented by a cube symbol.

30) Consider the following diagram.



The diagram shown above is an example for a

(a) profile diagram. (b) timing diagram. (c) communication diagram.
(d) timing sequence diagram. (e) interaction overview diagram.

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