UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (*EXTERNAL*)
Academic Year 2010/2011 – 2nd Year Examination – Semester 3

IT3104 – Object Oriented Analysis and Design
PART 1 - Multiple Choice Question Paper

26th February, 2011
(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 **08** pages.

- All questions are of the MCQ (Multiple Choice Questions) type.

- All questions should be answered.

- Each question will have 5 (five) choices with <u>one or more</u> 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**.

In questions 1-5, fill in the blanks with the most appropriate answer.

1) …………………. is a property of a class.

(a) A Behaviour	(b) An attribute	(c) An object
(d) An Object instance	(e) A Service	

2) .... means that when designing an object, one should separate what he knows about the object according to the minimum information needed to use the object and the information required to make the object work properly.

(a) Polymorphism	(b) Generalization	(c) Encapsulation
(d) Specialization	(e) Overloading	

3) An entity that contains attributes and behaviours which are common to one or more class subtypes is called a …………….

(a) super type	(b) abstract class	(c) derived class
(d) child Class	(e) generalized Class	

4) The UML …………. diagram provides a variety of symbols and encompasses a number of ideas, all to model the changes which just one object goes through.

(a) Use case	(b) Communication	(c) Sequence
(d) Deployment	(e) State	

5) A/An …………… diagram adds the dimension of time to object interactions.

(a) Component	(b) Interaction overview	(c) Composite structure
(d) Profile	(e) Sequence	

6) Examine the contents of the following **Column A** against those of **Column B.**

Column A	Column B
(A) Composite Structure diagram	(i) emphasizes the structural organization of the objects which send and receive messages.
(B) Communication diagram	(ii) decomposes the internal structure of a class, component or use case.
(C) Profile diagram	(iii) is especially useful when designing embedded software for devices.
	(iv) shows how and where the system will be deployed,
(D) Timing diagram	(v) allows one to define custom stereotypes, tagged values
(E) Deployment diagram	and constraints

Which of the following gives a correct matching of the contents of **Column A** with those of **Column B**?

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

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

(a) It is a modelling technique in which we turn user requirements into software.
(b) Inception phase of RUP establishes the business case for the project.
(c) RUP consists of a sequence of four phases, called Inception, Elaboration , Construction and Transition.
(d) RUP is an object oriented process
(e) During the construction phase, deployment of the software to the user community is done.

8)	Which of the following statements is/are correct regarding the relationship of a class diagram?

(a) Association relationship in a class diagram does not show the navigability.
(b) Aggregation relationship is drawn as a filled diamond.
(c) The notation 0..6 represents a specific range from 0 to 6 excluding 0 and 6.
(d) In UML, bi-directional associations are drawn either with arrowheads on both ends or without arrowheads altogether
(e) In *Generalization/Specialization* relationships, multiplicity is not stated.

Consider the following diagram to answer questions 9-10
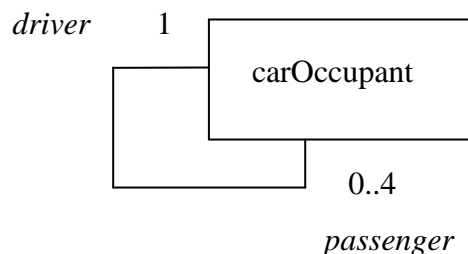
9)	Consider the following statements with regard to the above diagram.

  (i)   It is an example for a reflexive association.
 (ii)   *driver* represent the name of the association.
(iii)   *passenger* is a role name.

Which of the above statements is/are correct?

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

10)	Consider the following statements related to the above diagram.

   (i) Each carOccupant object can have links to 0..4 *driver* objects.
  (ii) Each carOccupant object can have links to 0..4 carOcupant objects playing the role of a *passenger*.
 (iii) Each carOccupant object can have links to 1 carOcupant object playing the role of a *driver*.

Which of the above statements is / are correct?

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

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11)	Which of the following is / are correct regarding *Classes* and *Class* diagrams?

(a) If two *classes* are connected with an arrow, messages can only be sent in the direction of the arrow.
(b) Whether a relationship between two *classes* is an *association* or a *composition* is domain dependent.
(c) A *class* is a descriptor for a set of objects that have the same features.
(d) UML 2.0 notation for aggregation is given below

(e) In UML 2.3, the notation for *composition* has been dropped.

12	Which of the following statements is/are correct regarding UML class diagrams?

(a) Association names are noun phrases that indicate the roles played by objects linked by the instance of the association.
(b) One can specify role names to the classes only on one end of the association.
(c) Imagine Lecturer and CourseOffering are two classes in a class diagram. A Lecturer object will play the role of *teacher* when they are linked by the instance of an *association*.
(d) *Role name* can be used instead of an association name.
(e) *Role name* is a noun that describes the reason for the existence of the relationship.

13)	Which of the following diagrams is/are correct regarding UML class diagrams?

(a) Multiplicity * in UML indicates *zero or more*.
(b) Multiplicity *1..** in UML indicates *one or more*.
(c) Multiplicity *1..5,16,18..** indicates *1 to 5 or 16* or more.
(d) An association class is an association that is also a class.
(e) It shows the message interactions between objects in a sequential manner.

14)	Consider the following Class diagrams.

Which of the following statements is/are correct regarding the above diagram?

(a) An order consists of 1 or more products.
(b) A product can be in one or many orders.
(c) A product object does not store a list of orders.
(d) A relationship between Order and Product is bidirectional.
(e) *consists* is the relationship name.

15)	Which of the following statements is/are correct regarding Use case modelling?

(a) When one needs to model things that happen at a specific point of time which are not triggered by any actor in the system, one can introduce an actor called Time or Timer.
(b) *includes* relationship shows the optional behaviour of a Use Case.
(c) *extends* relationship shows the compulsory behaviour of a Use Case.
(d) An actor can be another system that connects with the system being modelled.
(e) System actors should be the users of the intended system being developed.

16) | Which of the following is/are correct regarding Use case modelling?

> (a) Use cases are the things that the actors can do with the system.
> (b) The system boundary cannot be identified from a Use case model.
> (c) An actor is any one or any thing that will interact with the system.
> (d) In UML 2.0, actors may also represent other subjects, giving you a way to link different use case models.
> (e) Use case modelling is most appropriate for systems that are dominated by non-functional requirements.

17) | Which of the following statements is /are correct regarding Object Oriented Design and Modelling using UML?

> (a) Entity classes usually correspond to items in real life and contain information known as attributes, that describes the different instance of the entity.
> (b) An Entity class is an object class that contains business related information.
> (c) Interface class translates the user's input into information that the system can understand and use to process the business event.
> (d) Control class is an object class that contains business related information.
> (e) Entity class is an object class that provides functionality to read and write persistent attributes in a database.

18) | Take a look at the contents in column B in relation to those in column A.

Column A	Column B
(i) Entity Class	(A) takes the data pertaining to a business event and translates the data for appropriate presentation to the user.
(ii) Interface class	(B) coordinates messages between interface classes and entity classes and the sequences in which the messages occur.
(iii) Control class	(C) is an object class that contains business related information.
(iv) System Class	(D) is used to model the association between two classes in two instances to indicate that when a change occurs in one class it may affect the other class.
(v) Dependency Relationship	(E) isolates the other objects from operating system-specific functionality.

Which of the following represent (s) the correct matching(s) of the contents in column B in relation to those in column A?

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

19) | Consider the following activities.

> (i) Refining the use-case model to reflect the implementation environment.
> (ii) Modeling class interactions, behaviours and states that support the use case scenario.
> (iii) Identifying the business actors for the system.

Which of above statements is/are activities of Object-Oriented Design?

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

20) Some questions related to UML diagrams with possible answers are given below.
    (i). Q. Can *Time* be an actor in a use case model?
       A. Yes, to represent events that happens automatically.
    (ii). Q. Is there a difference between a focus of control and activation?
       A. Yes
    (iii). Q. What is a design pattern?
       A. It is a common solution to a given problem in a given context, which supports reuse of proven approaches and techniques.

  Which of the above pairs is/are correct?

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

21) Which of the following statements is/are correct regarding State Diagrams?

(a) They model aspects of the static behaviour of a system.
(b) They Show the sequential flow of activities of a use case or a business process.
(c) Three key elements of State Diagrams are *States*, *Events* and *Transitions*.
(d) They model how events can change the state of an object over its lifetime.
(e) They are used to model business processes in which several objects participate.

22) Consider the following incomplete statements related to UML.
  (i) …………………………… provide a mechanism to show activities that occur concurrently.
  (ii) In UML ………….. are represented as rectangles with rounded edges , ……………….. are drawn as directed arrows, decision points are shows as …………….
  (iii) The behaviour in an activity, entry action or exit action in a state diagram, can include sending an event to some other object. This can be modeled by the action preceded by a ………. character.

Identify from among the following, the correct order to fill the above blanks.

(a) State diagrams, events, transitions, synchronization bars, ^
(b) Sequence diagrams, activities, folks, activities, *
(c) Activity diagrams, activities, joins,   diamonds, ^
(d) Activity diagrams, activities, transitions , diamonds, ^
(e) State diagrams, events, transitions, synchronization bars, *

23) Consider the following statements related to UML 2.0 Sequence diagrams.
(i) Sequence diagrams show interactions between lifelines as a time-ordered sequence of events.
(ii) In UML 2.0, one can frame a sequence diagram by surrounding it with a boarder and adding a compartment to identify the diagram.
(iii) It is possible to start drawing a sequence diagram before identifying the corresponding use case.

Which of above statements is/are correct?

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

24) Consider the following statements related to UML 2.0 Sequence diagrams.

 (i) One places long thin rectangles on the dashed line below the lifeline to indicate when a particular lifeline has the focus of control.
 (ii) An arrow that connects one lifeline to another represents a message that one object sends another.
(iii) To represent recursion, the responsible object can be shown sending a message to itself.

Which of the above statements(s) is/are correct?

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

25) Examine the contents of the following **Column A** against those of **Column B**.

Column A	Column B
(i) Composite Structure diagram (ii) Communication diagram (iii) Interaction Overview diagram (iv) Deployment diagram (v) Timing diagram	(A) shows the configuration of software components within the physical architecture of the system's hardware nodes. (B) shows interaction of objects via messages. (C) models internal structure of a class. (D) is especially useful when designing embedded software for devices. (E) shows how objects interact within each activity of a use case.

Which of the following gives a correct matching of the contents of **Column A** with those of **Column B**.

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

26) Consider the following diagram

Send company
tax return
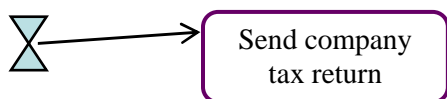
End of business
year occurred

Which of the following statement is/are correct in relation to the above diagram?

(a) The diagram given is a UML 2.0 Timing diagram.
(b) Activity linked to the time event is missing in the diagram.
(c) You may need to wait till end of business year to send the company tax return.
(d) A time event is generated at the end of every business year and this causes the activity 'Send company tax return' to execute.
(e) ▽ is a symbol introduced in UML 2.0 to represent duration of time events.

27) Consider the following statements in relation to UML diagrams.
    (i)   Profile diagram is newly introduced from UML 2.2.
    (ii)   In an activity diagram, there may be more than one ending activity.
    (iii)   In an Activity diagram, a synchronization bar specifies the activities which can be done one after the other.

 Which of the above statement(s) is/ are true?

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

28) Consider the following statements in relation to UML 2.0 diagrams.
    (i)   Collaboration diagrams are renamed as Communication diagrams.
    (ii) Component Structure Diagram is a new diagram added to show the internal structure of a class.
    (iii) The following diagram is an example of a Profile diagram.

Wait 10 seconds
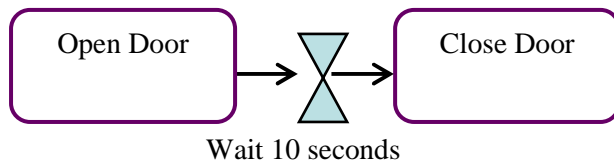
Which of the above statement(s) is/ are true?

(a) Only (i)
(b) Only (ii)
(c) Only (iii)
(d) Only (i) and (iii)
(e) Only (ii) and (iii)
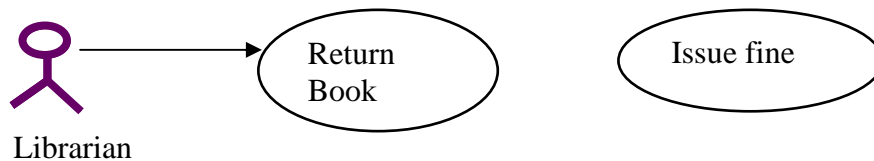
29) Which of the following is/are related to Object Oriented Methodology?

(a) Each iteration in Unified Process (UP) contains all of the elements of a normal software development project.
(b) SSADM is an Object Oriented Methodology.
(c) Each iteration in UP comprises a partially complete version of the final system and any associated documentation.
(d) UP has four core workflows namely Inception, Elaboration, Construction and Transition.
(e) The amount of work done in each core workflow varies according to the phase of the UP.

30) Which of the following is/are correct regarding UML 2.0 diagrams?

(a) Use Cases also have attributes and operations.
(b) Actor generalization factors out behaviour common to two or more actors into a parent actor.
(c) Use Case generalization can be used when you have one or more Use Cases that are really specializations of a more general use case.

(d) The relationship between the Use Cases in the following diagram is an *include* relationship.

(e) Connection points in State diagrams, represents points of entry into a state or exit out of state.

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