**Department of Higher Education**

**University of Computer Studies, Yangon**

**Second Year ( B.C.Sc)**
**Final Examination**

**Object Oriented Analysis and Design (CS – 204)**
**September, 2018**

**Answer all questions.** **Time Allowed: 3 hours**

I. Choose the correct answer for the following statements: **(25 marks)**

(1) _____ is a set of interrelated objects or elements that are viewed as a whole and designed by human beings to achieve a purpose.
(A) Class (B) System (C) Object (D) Method

(2) A dotted line connect to an object in a sequence diagram that indicates the existence of the object over a period of time is called _____.
(A) association (B) straight line (C) life line (D) horizontal line

(3) A _____ is a contract or an obligation of a class.
(A) Constraint (B) note (C) responsibility (D) attribute

(4) An object can have which of the following multiplicities?
(A) Zero (B) one (C) more than one (D) all of above

(5) The first step in constructing a class diagram is to identify objects in the problem domain.
(A) True (B) False

(6) A line with hollow arrowhead represents _____ relationship.
(A) realization (B) association (C) dependency (D) generalization

(7) Object-oriented system development is based on the principle stages of the _____ life cycle.
(A) Traditional system (B) typical system (C) rapid prototyping (D) evolutional system

(8) A ____ is a description in natural language of a particular sequence of interactions between the user and the system.
(A) use case (B) scenario (C) note (D) tagged value

(9) The term _____ is often used for finding and correcting errors that were not detected before the system was handed over.
(A) testing (B) maintenance (C) checking (D) validation

(10) Multiple inheritances allow a class to inherit features from more than one superclass.
(A) True (B) False

(11) CRC approach is used to identify _____ .
(A classes (B) use cases (C) objects (D) collaborations

(12) What is the meaning of requirement elicitation?
(A) gathering of requirements (B) understanding of requirement (C) getting the requirements from clients (D) all of the above

(13) An association must _____ .
(A) Be described by nouns (B) Have attributes (C) Be described by a verb
(D) Have a 1:M component

(14) Super class represents _____ abstractions.
(A) generalized (B) specialization abstractions (C) Both (D) None of the mentioned

(15) What is the other name for Encapsulation?
(A) Aggregation (B) Interface management (C) Polymorphism (D) Information hiding

(16) A data dictionary provides a central store of data about _____.
(A) Class (B) Object (C) Data (D) Database

(17) _____ is one of the most important activities in the system development process.
(A) Testing (B) Modeling (C) Implementation (D) Requirement Engineering

(18) An interaction diagram that emphasizes the time-ordering of messages is called as ____ diagram.
(A) State (B) Collaboration (C) Activity (D) Sequence

(19) To represent a generalization relationship, what phrase is best to use?
(A) 'Is a kind of' (B) 'Is a part of' (C) 'Is a replica of' (D) 'Is composed of'

(20) Attribute may be identified from _____ phrases in the problem description.
(A) Noun (B) verb (C) pro-noun (D) adjective

(21) A state diagram only ever describes the behavior of a single _____.
(A) class (B) attribute (C) operation (D) function

(22) Sequence and collaboration diagrams are called _____.
(A) use case diagram (B) state chart diagram (C) object diagram (D) interaction diagram

(23) _____ is the final stage of the system life cycle, where errors are corrected and minor modifications carried out.
(A) Maintenance (B) Checking (C) Testing (D) Correcting

(24) In a sequence diagram, the activation can be represented by drawing a narrow vertical rectangle over the _____ lifeline.
(A) class's (B) object's (C) message's (D) function's

(25) Requirement _____ may be used as a vehicle for communication between developers, users and other stakeholders.
(A) Validation (B) elicitation (C) specification (D) analysis

II (a) What are the main benefits of the system life cycle? **(5 marks)**

(b) Identify some of the classes that you would expect to find in each of the following system. **(5 marks)**

- a system for a library
- a system to manage hotel booking
- a mail-order clothes system
- an airline booking system
- a system for an X-ray clinic

(c) Describe the stages in building a class diagram. **(5 marks)**

III (a) Draw diagrams to link the following classes using aggregation, inheritance and multiplicity where appropriate. **(15marks)**

- Museum, Friend, Staff, Curator, Guide, Administrator, Room, Exhibition, Item
- Payment, Customer, Order, Order Line, Product, Standing Order, Exception Order, Promotion Order
- Meal, Drink, Food, Soft Drink, Alcoholic Drink, Starter, Main Course, Dessert

(b) Draw a class diagram, including class attributes, to represent the information given in the paragraph below. **(15 marks)**

University departments run several courses, each of which is included in at least one degree scheme, run by a Scheme Tutor. A department is headed by a professor and there are also other professors, both permanent and visiting. A student registers on a number of courses and, if successful, is eventually awarded a degree.

List sample attributes and operations for the class Course.

Write a data dictionary definition for the class Course.

IV. Read through the scenario below, describing what happens when a car enters in car park. Draw an interaction diagram to illustrate this information. **(20 marks)**

- The driver sees that the Full sign is off
- A car's arrival is detected by the sensor and this information is passed to the car park
- The car park checks to see if there are still spaces
- There is still at least one space available
- A card is inserted into the card reader by the driver
- The card reader reads the card number and checks that it is in the list of valid cards
- The card is recognized as known to the system and the card is returned
- The card reader tells the barrier to raise itself
- The sensor sends a message to the barrier that the car is no longer detected
- The barrier lowers itself

V**.** Draw a state diagram to illustrate a kitchen timer. To start with, the timer is off. It can be set to move it into the Set state, and turned off to move it back to the Off state; in the Set state the time can be changed. Once the timer is set and the set time reached, the alarm rings. The alarm can be turned off, or will stop automatically after one minute. The timer may break at any time. **(10marks)**