SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Information Technology

Second Year, First Semester Examination – 2015

HNDIT 2312/HNDIT 3103 – Object Oriented Analysis and Design

Instructions for Candidates:
Answer any five questions.
All questions carry equal marks.

No. of questions: 06
No. of pages : 05
Time : Three hours (03 hours)

Question 01 **[Total marks 20]**

(i.) Define the term Polymorphism in object oriented programming and list down any two types of it.

(Marks 05)

(ii.) Explain the following concepts with an example.

a) Data abstraction
b) Encapsulation

(05x2=10 Marks)

(iii.) Object oriented approach is more popular than the traditional approach. Do you agree with this statement? Validate your answer with reasons.

(Marks 05)

Question 02 **[Total marks 20]**

(i.) What are the advantages of the following Object Oriented concepts?

(Marks 02 x 3 =06)

a) Function overloading
b) Constructors
c) Inheritance

(ii.) Write simple C++ programs to illustrate each of the concepts given in part (i.)

(Marks 03 x 3=09)

(iii.) Write C++ code relevant to the following class. (Marks 05)

Circle
-radius:double = 1.0 -color:string = "red"
+Circle(radius:double,color:string) +getRadius():double +setRadius(radius:double):void +getColor():string +setColor(color:string):void +getArea():double

Question 03 **[Total marks 20]**

(i.) What is a software development process? (Marks 02)

(ii.) What are the key activities in software development process? (Marks 05)

(iii.) Describe Unified Software Development Process. (Marks 03)

(iv.) State the main features of Unified Software Development Process. (Marks 04)

(v.) Briefly describe the following phases.

a) Inception Phase
b) Elaboration phase

(Marks 03*2 = 06)

Question 04 **[Total marks 20]**

(i.) Define Unified Modeling Language (UML). (Marks 02)

(ii.) Illustrate the basic notations used in the Use Case Diagram. (Marks 04)

(iii.) Read the following scenario carefully and answer the following questions.

Hospital Reception subsystem supports some of the many job duties of hospital receptionist. When registering a patient the receptionist schedules patient's appointments and admission to the hospital. Patient may be admitted as outpatient or inpatient. However registration is a must. For the patient who will stay in the hospital ("inpatient") he or she should have a bed allocated in a ward. The receptionist might also receive patient's payments, record them in a database and provide receipts. Further he or she files insurance claims and medical reports also.

a) Identify the actor or actors in the above mentioned system. (Marks 02)
b) Identify the use case or use cases in the above system. (Marks 04)
c) Draw the most suitable Use Case Diagram for the above mentioned system. (Marks 08)

Question 05 **[Total marks 20]**

(i.) What is the difference between class notation and object notation in UML? (02 Marks)

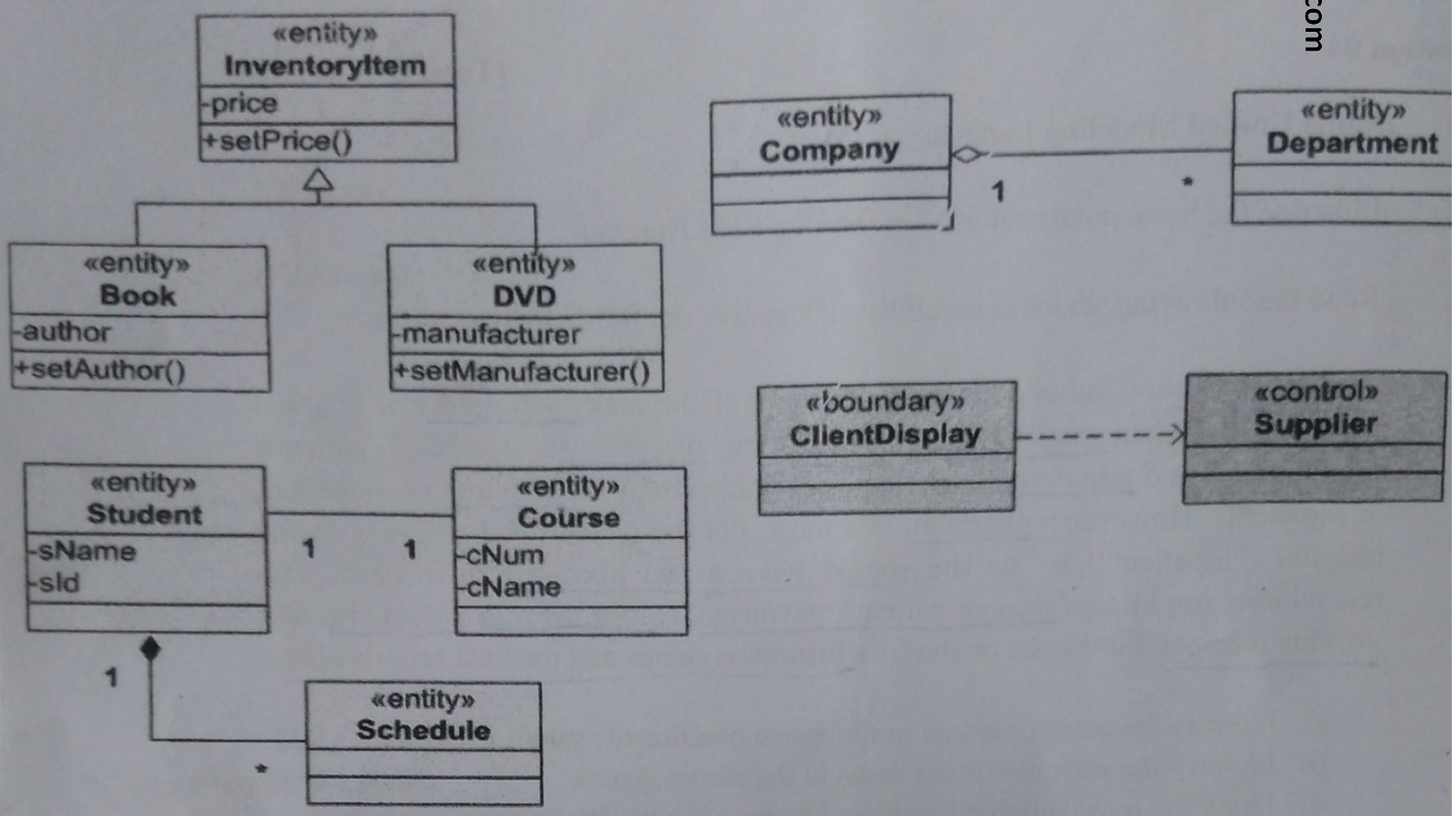
(ii.) State three (03) key entities that can be identified in the composite structure diagrams (03 Marks)

(iii.) Consider the following UML Class Diagram snippets and identify the type of relationship between classes given below.

a) InventoryItem and Book
b) Student and Course
c) Student and Schedule
d) ClientDisplay and Supplier
e) Department and Company

(05 Marks)

Invension ~~Encapsulation~~ ——
Aggregation ——▷
Composition ——▶



(iv.) Consider the following description to design a system for a university.

- In a university there are different lecture rooms, offices and departments. A department has a name and it contains many offices.
- Each person may play the role of a student or an employee and has a unique ID. The employee can be either a professor or a registrar. The student may be an under-graduate, master student or Ph.D. student. A professor can be a full, associate or assistant professor and he/she belongs to one department.
- Offices and classrooms have a number ID, and a classroom has a number of seats.
- Every employee works in an office.

a) Identify the classes of the system.

(04 Marks)

b) Draw the UML class diagram for the above system. Indicate relationships and multiplicities between classes clearly.

(06 Marks)