

8/10/14/AN  
LIB

Reg. No. : 

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**Question Paper Code : 45286**

5 Year M.Sc. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Sixth Semester

Software Engineering

ESE 064 — OBJECT ORIENTED ANALYSIS AND DESIGN

(Regulation 2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Identify the attributes and methods of a fully automatic washing machine.
2. Draw a simple class diagram (without attributes and behaviour) using aggregation for airplanes.
3. Differentiate generative and non-generative patterns.
4. List two possible scenarios under which “framework” can be used.
5. Mention the six major steps in the OOA process.
6. Who are the actors in a college timetable system? Justify your answer.
7. What are the implications of the Occam’s razor in the design of an object oriented application?
8. What is the advantage of a design pattern?
9. With examples justify when a static model or a dynamic model is to be used.
10. What is the use of the deployment diagram?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Create a class diagram and justify the relationship among the classes to organize the following fruit classes simple, aggregate and multiple. A simple fruit may have fleshy fruits or dry fruits. Raisins, plums and dates are simple dry fruits. Gooseberry, cherry and peach are simple fleshy fruits. Raspberry, strawberry and blackberry are examples of aggregate fruits. Pineapple, fig and mulberry are multiple fruits.

The fruits have the following characteristics

- A multiple fruit is one formed from a cluster of flowers where each flower produces a fruit
  - Pineapples are consumed fresh and the pineapples leaves are used to produce the textile fibre a component of wall paper and furnishings
  - Gooseberries can be preserved in the form of jams, dried fruit. or as the primary or a secondary ingredient in pickling, or stored in sugar syrup
  - Mature plum fruit may have a dusty-white coating that gives them a glaucous appearance
  - Strawberry characteristic aroma, bright red color, juicy texture, and sweetness.
- (ii) Explain the object oriented philosophy, abstraction, encapsulation and information hiding.

Or

- (b) With the library management system as an example, write short notes on the following.
- (i) Identify object
  - (ii) Inheritance
  - (iii) Polymorphism
  - (iv) Object containment.
12. (a) Prepare an object diagram and state transition diagram as suggested by Booch that might be used to troubleshoot a 4-cycle lawn mower engine. Power is developed in such an engine by the combustion of a mixture of air and gasoline against a piston. The piston is attached to a crankshaft via a connecting rod, and moved up and down inside a cylinder as the shaft rotates. As the piston moves down a intake valve opens, allowing the piston to draw a mixture of fuel and air into the cylinder. At the bottom of the stroke, the intake valve closes. The piston compresses and heats the mixture as it moves upwards. Rings in grooves around the piston rub against the cylinder wall providing a seal necessary for compression and spreading lubricating oil. At the top of the stroke, an electrical spark from a spark plug detonates the mixture. The expanding gases develop power during the downward stroke. At the bottom, an exhaust valve is opened. On the next upward stroke the exhaust gases are driven out.

Or

- (b) A potential buyer contacts the office and is given details that meet his requirements. He is then added to the mailing list and will be sent particulars of suitable properties as they come on to the market.

Sellers ask for a valuation and an agent is sent round to value the property. Valuing the property consists of making notes of the property details, measuring rooms and estimating the price the property could fetch. Afterwards the sellers are sent a standard letter outlining the service provided by the firm and quoting price for the property. Property detail leaflets are typed from the valuation notes, Property details for the newspaper have to be ready by Monday at 4 p.m.

Buyers put in an offer on a house to the agent who conveys it to the seller. If the seller accepts the offer then the house is marked as 'under offer'. The agent does nothing further until the legal details are sorted through the solicitor.

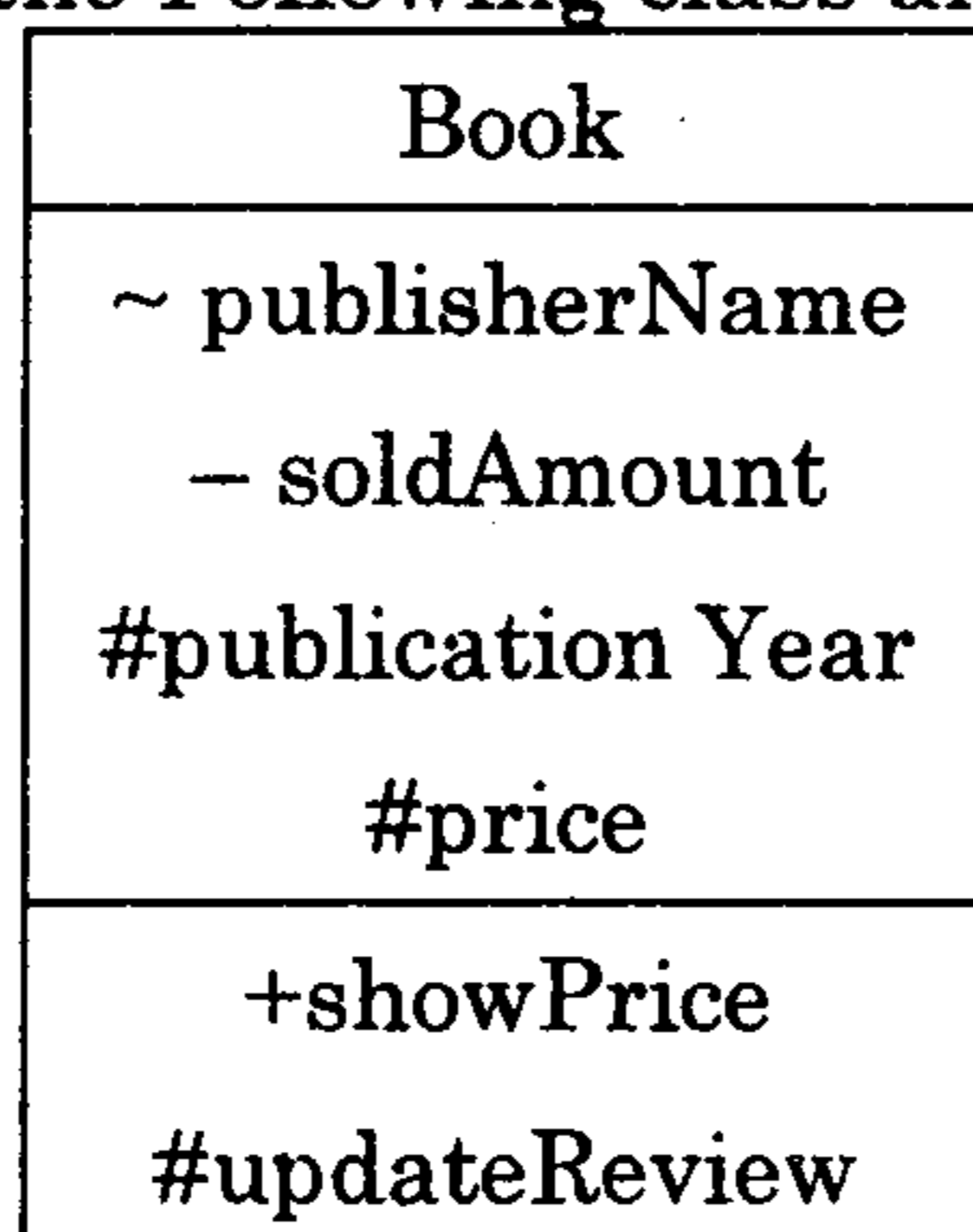
Draw an OMT DFD for the estate agent's system.

13. (a) Describe the various components of a use case diagram. Analyze the steps involved in constructing a use case diagram for the following requirements specification:

Web Customers use some web site to make purchases online. They can just view items which include options like – search for items, browse catalog, view items recommended for him/her, add items to shopping cart or wish list to find and see some products. If required, they can purchase products. Customer authentication is required for specific purposes like getting some coupons or be invited to private sales, and hence they need to register on the web site. After making purchase, the customers can make the payment which could be done either by using credit card and external credit payment service or with PayPal and then may checkout of the website.

Or

- (b) Using the payroll system explain the noun phrase approach.
14. (a) Consider an e-shopping application for books. Identify the various access modifiers shown in the following class and explain them.



What are the other ways to refine attributes and how can the example given refined attributes further? Draw activity diagram for purchasing a book.

Or

- (b) With the payroll system as case study, explain the object oriented design process.
15. (a) A product is to be installed to control elevators in a building with  $m$  floors. The problem concerns the logic required to move elevators between floors according to the following constraints:

Each elevator has a set of  $m$  buttons, one for each floor. These illuminate when pressed and cause the elevator to visit the corresponding floor. The illumination is cancelled when the elevator visits the corresponding floor.

Each floor, except the first floor and top floor has two buttons. one to request and up-elevator and one to request a down-elevator. These buttons illuminate when pressed. The illumination is canceled when an elevator visits the floor and then moves in the desired direction.

When an elevator has no requests, it remains at its current floor with its doors closed. Draw the

- (i) Activity diagram  
(ii) Sequence diagram.

Or

- (b) Explain the UML behaviour diagrams using the banking system.