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**INTERNATIONAL CENTRE FOR APPLIED SCIENCES**  
(Manipal University)  
**II SEMESTER B.S. DEGREE EXAMINATION – NOV. 2017**  
**SUBJECT: SOFTWARE DESIGN USING OBJECT ORIENTED PARADIGM (CS 122)**  
(BRANCH : CS & CE)  
**Tuesday, 21 November 2017**

**Time: 3 Hours**

**Max. Marks: 100**

✓ **Answer ANY FIVE Questions.**

Case Study: Newspaper Agency Automation Software (NAAS)

The local newspaper and magazine delivery agency has asked us to develop a software for him to automate various clerical activities associated with its business. Newspaper Agency Automation Software (NAAS):

- This software is to be used by the manager of the news agency and his delivery persons.
- For each delivery person, the system must print each day the publications to be delivered to each address. The addresses should be generated in consecutive order as far as possible so that the commutation of the delivery person is minimal.
- Customers usually subscribe one or more newspapers and magazines. They are allowed to change their subscription list by giving one week's advance notice.
- For every delivery person, the system must print on a day to day basis the publications to be delivered to each address.
- The system should also print for the news agent the information regarding who received what publications and summary information of the current month.
- At the beginning of every month bills are printed by the system to be delivered to the customers. These bills should be computed by the system automatically and should include the publication type, the number of copies delivered during the month and the cost for these.
- The customers may ask for stopping the deliveries to them for certain periods when they go out of station.
- Customers may request to subscribe new newspapers/magazines, modify their subscription list or stop their subscription altogether.
- Customers usually pay their monthly dues either by cheques or cash. Once the cheque number or cash received is entered in the system, receipt for the customer should be printed.
- If a customer has any outstanding dues for more than a month, a polite reminder message is printed and his subscription is discontinued if his dues remain outstanding for period of more than two months.
- The software should compute and print out the amount payable to each delivery boy. Each delivery boy gets 2.5% of the value of the publications delivered by him.

1A. Explain:

- i) Inheritance
- ii) Encapsulation
- iii) Polymorphism

1B. Differentiate between Class and Objects.

**(15+5)**

- 2A. Draw Use Case Diagram for Newspaper Agency Automation Software (NAAS).  
2B. Draw Sequence Diagrams for anyone of the use cases identified for Newspaper Agency Automation Software (NAAS). **(10+10)**
- 3A. Explain Unified Process Model in detail with help of a diagram.  
3B. Explain FRUPS+ in detail. **(10+10)**
4. Explain GRASP. **(20)**
5. Explain Noun Phrase Approach, Common Class Patterns Approach, CRC Approach with Examples. **(20)**
- 6A. Draw a State Chart Diagram for a simple landline Phone.  
6B. Write a fully dressed Use-Case specification for any one use case of Newspaper Agency Automation Software (NAAS). **(10+10)**
7. Draw a Design Class Diagram (DCD for Newspaper Agency Automation Software (NAAS) and explain all the notations used. **(20)**
- 8A. Explain the four phases of Unified Approach.  
8B. Water Fall Model and its shortcomings.  
8C. Explain Coupling and Cohesion between Classes.  
8D. Explain Object Oriented Analysis and Design. **(5+5+5+5)**

