Reg. No.										

INTERNATIONAL CENTRE FOR APPLIED SCIENCES

(Manipal University)

II SEMESTER B.S. DEGREE EXAMINATION –APRIL / MAY 2017

SUBJECT: SOFTWARE DESIGN USING OBJECT ORIENTED PARADIGM (CS 122)

(BRANCH : CS & CE)

Friday, 28 April 2017

Time: 3 Hours **Max. Marks: 100**

✓ **Answer ANY FIVE FULL Questions.**

Simulation Software: A factory has different categories of machines such as lathe machines, turning machines, drilling machines soldering machines, etc. the factory can have different number of machines from each category such as 200 lathe machines, 50 drilling machines, etc. These machines require frequent adjustments and repair. Each category of machine falls uniformly after continuous operation and the failure profile of the different categories of machines is given by its mean time to failure (MTTF). A certain number of adjusters are employed to keep the machine running. The adjusters have expertise in maintaining different categories of machines. An adjuster may be expert in maintaining more than one type of machine. A service manager coordinates the activities of the adjusters. The service manager maintains a queue of inoperative machine. If there are machines waiting to be repaired, the service manager assigns the machine at the front of the queue to the next available adjuster. Likewise, when some adjusters are not busy, the service manager maintains a queue of idle adjusters and assigns the adjuster at the front of the queue to the next machine that breaks down. At any given time, one of the two queues will be empty. Thus, the service manager needs to maintain only a single queue, which when it is not empty contains only machines or only adjusters. The factory management wishes to get as much as possible out of the machines is up and running and the adjuster utilization—the percentage of time an adjuster is busy. The goal of our simulation is then to see how the average machine and adjuster utilizing depend on such factory as the number of machines, the number of adjusters, and the reliability of the machines in terms of mean time to failure (MTTF). This software would be used by different factories to determine the optimum number of adjusters that they should employ

1A. Explain:

i) Inheritance

ii) Encapsulation

iii) Polymorphism

1B. Differentiate between Class and Objects.

(15+5)

2A. Draw Use Case Diagram for **Simulation Software.**

2B. Draw Sequence Diagrams for anyone of the use cases identified for **Simulation Software.**

(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 an elevator.

6B. Write a fully dressed Use-Case specification for any one use case of **Simulation Software**

(10+10)

7. Draw a Design Class Diagram (DCD for **Simulation Software** 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)