NEPAL COLLEGE OF INFORMATION TECHNOLOGY

Level: Masters
Faculty: Computer Engineering, Computer Science
Subject: Object-oriented Software Engineering, Spring 2017

Time: 3 hours
Full marks: 75
Pass marks: 45

Candidates are required to give their answers in their own words as far as practicable.

ANSWER FOLLOWING QUESTIONS

1. How can chaos in complexity of a system be organized? Recommend strategies for managing complex systems. **5**

2. Explain different types of relationships among objects with suitable examples. **10**

3. DriveSafe is a security system for connected vehicles. A connected vehicle has multiple communication mediums such as 4G to connect to mobile network, Bluetooth to connect to nearest mobile devices, and RF communication for medium range broadcast communication. The DriveSafe system actively sends the vehicle's current speed, current lane used by the vehicle and its type to the surrounding of the vehicle via RF communication. The system also continuously scans for signals from other vehicles in the surrounding. When a vehicle nears another vehicle, the DriveSafe system measures the speed of both of the vehicles, orientation in the lane and type then suggests the driver relevant speed and lane to follow. **5+5**

For the given scenario, develop a use-case and identify initial entity objects.

4. Differentiate sequence diagram, activity diagram and communication diagram. **5**

5. Explain workflows of unified process. Demonstrate how multiple iterations of these workflows create an agile process. **5+5**

6. Develop a component diagram for the given scenario in Q.3. Identify interfaces and develop their specifications. **5+5**

7. Explain design pattern and its components. For system design of the scenario given in Q.3, demonstrate reuse of a design pattern with justification. **5+5**

8. Write short notes on followings. **5+5+5**

a. RT-UML
b. Software metrics
c. Incremental development vs. prototyping