NEPAL COLLEGE OF INFORMATION TECHNOLOGY

Level: Masters | Time: 3 hours
Faculty: Computer Engineering, Computer Science | Full marks: 75
Subject: Object-oriented Software Engineering, Spring 2019 | Pass marks: 45

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

ANSWER FOLLOWING QUESTIONS

1. Explain use of risk exposure and risk matrix in risk analysis with suitable examples. 10

2. For a semi-detached mode of software project, calculate duration and no. of people required to develop a component that consists 65000 lines of code using intermediate COCOMO model. The component must be very highly reliable and is considered to be highly complex. 10

	A_i	B_i	C_i	D_i
Oragnic mode	2.4	1.05	2.6	3.4
Semi-detached mode	3.0	1.12	2.6	3.3
Embedded mode	3.6	1.20	2.6	3.2

	Very Low	**Low**	**Nominal**	**High**	**Very High**	**Extra High**
RELY	0.75	0.88	1.00	1.15	1.40	--
CPLX	0.70	0.85	1.00	1.15	1.30	1.65

3. A smart foldable phone folds itself when a user presses a 'Fold My Phone' button or being idle for 10 minutes. When the 'Fold My Phone' button is pressed, collision detector enables sensors to monitor any obstacle in the phone's 'collision space'. If the collision space is free of obstacles, the sensors trigger 'fold phone' function. Then 'fold phone' function folds the phone. If the collision space is not free of obstacles, the collision detector continuously scans for obstacles. When the collision space is free from obstacles, it folds the phone. A user can cancel the fold operation or unfold the phone by pressing the 'Fold My Phone' button again. 15

   a) Identify functional requirements of the work flow for folding the phone by pressing 'Fold My Phone' and represent it using use-case description. (5+5)

   b) Develop a sequence diagram for folding the phone by pressing 'Fold My Phone'. (5)

4. How different techniques are used to complex systems are decomposed into smaller sub-systems during object-oriented design phase? Explain 4 different techniques with example of each. 10

5. Why model transformations are essential before object-oriented implementation? Explain 3 different model transformations with suitable example. 10

6. What are the relationships between classes that need to be modeled during object-oriented analysis phase? 5

7. Why delegations are desired over inheritance? Explain. 5

8. Explain how different elements of object model help model and design complex systems with suitable example. 10