



NEPAL COLLEGE OF INFORMATION TECHNOLOGY

Level: Masters

Faculty: Computer Engineering, Computer Science

Subject: Object-oriented Software Engineering, Fall 2018

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. Why object-oriented approach is best suited for developing software for complex systems? Explain elements of object model and how they help model complex systems. 2 + 8
2. For a software project aimed to develop an embedded software having two-components with an estimated 50000 lines of code for 1st component and 80000 lines of code for the second, estimate phase-wise effort and duration required for both components. The reliability of the system must be high, and personnel experience of the development team is also high. Following tables provide coefficients for reference. 15

	A	B	C	D
Organic	2.4	1.05	2.5	0.38
Semi-detached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

	Very low	Low	Nominal	High	Very high	Extra high
RELY	0.75	0.88	1.0	1.15	1.40	--
PEXP	1.7	1.3	1.0	0.8	0.7	0.6

	Plan & Req.	Sys. Design	Detailed design	Coding	Integration & Testing	Very high
Embedded μ_p	0.1	0.17	0.23	0.2	0.3	
Embedded τ_p	0.12	0.18	0.25	0.3	0.15	

3. Identify 4 crucial software project risks in Nepali scenario and provide strategic recommendations mitigate the risks. 10
4. Differentiate sequence diagram, activity diagram and communication diagram. 5
5. What is the role of non-functional requirements during system design? Provide an example of how following requirements are translated into system design. 4 + 6

A student can take many subjects. Students are allowed to take only those subjects for which they are enrolled.

6. For following workflow, develop a complete use case. 10

An automated car allows its passenger to set destination by speaking "Destination: 30 Annapurna Marg, New Baneshwor, Kathmandu". After the voice is heard, the system repeats it by system voice on speaker, and also shows the map of destination. Once the passenger hears the reply/views the map, the passenger speaks

confirmation words such as “Yes, that’s right” or “Yeah, let’s go” or “Sure, let’s move”. The system then locks the doors then starts self driving.

7. What is an interface? How interface is modeled, provide an example. 5
8. Write short notes on: 5+5
 - a. CMM vs ISO standard (Msc. Computer Science)
 - b. Real-time UML (Msc. Computer Science)
 - c. Joint-Application Design (ME Computer Engineering)
 - d. Cyclomatic complexity for path testing (ME Computer Engineering)