

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2076 Chaitra

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	III / I	Time	3 hrs.

Subject: - Software Engineering (CT 601)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

1. What is software crisis? What are typical software characteristics? [4+3]
2. Explain the Prototyping model of software development. What are its advantages and disadvantages? [5+2]
3. Study the narration for a ride sharing system and prepare analysis and design models as specified below:

Real-time ridesharing is a service that arranges one-time shared rides on very short notice. Vehicle owners register to the system as Service Provider and customers register as Service Seeker. The vehicle registration can be done for motorbike and car only. This type of service makes use following technological advances:

- GPS navigation devices to determine a driver's route and arrange the shared ride
- Smartphones for a traveler to request a ride from wherever they happen to be

These elements are coordinated through a mobile application, which can instantaneously handle the driver payments and match using an optimization algorithm. When a seeker needs ride, he/she opens the mobile app which automatically tracks his/her location and marks as pick-up point. Seeker sets the drop-off point using map. Seeker can also search the location and set his/her drop-off point. The system calculates the estimated fare and seeker needs to confirm the ride. System searches the near by service providers and displays the information about the provider including the vehicle number and mobile number. Once the service provider picks the seeker, system tracks the route followed and calculates the fare once they reach to the drop-off point. Seeker may pay in cash or other electronic platform like e-sewa. Seeker can provide the feedback about his/her ride and can also view the ride history.

- a) List functional and non-functional requirements for the system. [5]
- b) Draw Level 0 DFD. [3]
- c) Draw Level 1 DFD. [5]
4. Describe software architecture. Explain Client-Server architecture and its importance. [3+4]
5. What is the role of data acquisition system? Explain the difference between hard and soft real time system. [2+3]
6. What are the main problems with software reuse? List key factors that should be considered for reusing software components. [3+3]
7. Differentiate between verification and validation. What are the types of the faults that can be uncovered by software inspection? Differentiate between black-box testing and white-box testing. [3+2+5]
8. What is component composition? Briefly explain the use of COCOMO model. [2+3]
9. Explain different levels of CMMI. [5]
10. What is FTR? How is Formal Technical Review (FTR) performed? [2+5]
11. Write short notes on: [4×2]
 - a) Modular decomposition styles
 - b) Need of software configuration management