Nirma University

Institute of Technology

Semester End Examination, December 2020

B. Tech. in Computer Science & Engineering, Semester - V

2CS504 – Software Engineering (SE)

Roll/ Exam No.		Supervisor's initial with date	

Time: 1 Hour 30 Minutes Max.Marks:40

Instructions:

1. **Attempt all questions.**
2. **Figures to right indicate full marks.**
3. **Draw neat sketches wherever necessary.**
4. **Do not alter the sequence of questions while attempting.**
5. **Fill all student details on each page as per instructions given by exam section**
6. **Assume suitable data wherever required and mention those**

Q.1 Assume the scenario given below and do as directed. Assume suitable assumptions (if any), mention those and then attempt the question. **[10]**

Government of India has decided to develop an online portal "**India's COVID- Patients & Hospital Management System (ICPHMS)**". The main aim for developing this portal is for managing, maintaining and tracking daily hospitalization data of patients, doctors and pera medical staff and front line workers associated with the hospitals, which is a major step forward in quantifying the current impact on local hospital systems, modeling and forecasting future utilization needs, and tracking the rate of change in the disease severity. Also, through this system the need is to respond virtually to the COVID pandemic and protect, educate and care for citizens in the community in a quick and effective manner.

Through this portal the Ministry of Health and Family Welfare (MoHFW) department will be able to be in direct touch with each States Health Department to track and monitor the COVID situation in each States of India. The State's health department will be able to be in direct touch with Urban Health Centres (UHC) of each city/village within their respective state.

The UHC's will be doing day to day reporting to respective Health Department of their State and respective Health Department of the State will be reporting to the MoHFW on day to day basis.

The Government Hospitals and Designated Private COVID Hospitals in each city/village of every State of India will be maintaining the entire medical records for each patient admitted in their hospital for the COVID treatment.

This portal which is to be developed will also be integrated with the Argoya Setu app which is a mobile application developed by the Government of India

to connect essential health services with the people of India in our combined fight against COVID. The App is aimed at augmenting the initiatives of the Government of India, particularly the Department of Health, in proactively reaching out to and informing the users of the app regarding risks, best practices and relevant advisories pertaining to the containment of COVID.

a) List the Functional & Non-Functional requirements.
b) Draw use case diagram and sub-use cases for the given scenario
c) Write use case specification document for each use case.

Q.2 A software system is to be developed to manage the records of patients who enter a clinic for treatment. The records include records of all regular patient monitoring (temperature, blood pressure, etc.), treatments given, and patient reactions and so on. After treatment, the records of their stay are sent to the patient's doctor who maintains their complete medical record. Identify the principal viewpoints which might be taken into account in the specification of this system. Represent the principle viewpoints in a hierarchical manner. **[10]**

Q.3 What is the significance of Software Process Model? List the basic categories/types of process models based on process flow. By changing a process model for a project what can be achieved? Compare atleast 4 process models based on various parameters (list those parameters too). **[10]**

Q.4 Consider the following system: **[10]**

i) User wants to maintain customer data and product data and needs to reference supplier data.
ii) User wants to add, change and delete customer data, wants to inquire on Customer and also requires four different reports on Customer with calculated data.
iii) User wants to add, change, delete Product data, wants to inquire on Product and also requires a report on Product with calculated data.
iv) User wants to inquire on Supplier using supplier number and also requires a report on Supplier with totaling results.

All of these data are of average complexity and overall system is moderately complex i.e. assume sum of value adjustment factors is 50. Given the historical data that the organizational average productivity for systems of this type is 9.5 FP/pm. Also, labor rate is of 9000 Rs. per month, the cost per FP is approximately 1600 Rs.. Based on the data provided, compute the following:

a) Compute FP for the system.
b) Total estimated project cost of the system.
c) Estimated effort in person months.

OR

Q.4 From the table given below which sets out a number of activities, duration and dependencies, draw an activity network which shows the project schedule. Identify the critical path and total number of weeks for project completion. Also, calculate the float time for each and every activity. **[10]**

All formulas and each calculation steps are to be mentioned.

Ensure that you:

- Construct the CPM network.
- Determine the critical path mention and highlight that in the CPM network.

Activity Number	Activity Name	Duration (weeks)	Dependencies / Predecessor
1	Obtain requirements	4	-
2	Analyze operations	4	-
3	Define subsystems	2	1
4	Develop database	4	1
5	Make decision analysis	3	2
6	Identify constraints	2	5
7	Build module 1	8	3, 4, 6
8	Build module 2	12	3, 4, 6
9	Build module 3	18	3, 4, 6
10	Write report	10	6
11	Implementation	8	7, 8, 9
12	Integration and test	2	10, 11

******** Best of Luck ********