National Institute of Technology Rourkela
Computer Science and Engineering
Software Engineering (CS3004), Mid-Semester Exam (Spring 2023-24)
Date of Examination: February 23, 2023

Time: 120 Minutes   **Max. Marks: 30**

Instruction: *1. In case of any doubt, write your assumptions, write it clearly and continue.*
2. There are 4 questions printed on both sides of the paper. Attempt all the questions.

Q1. Answer the following:
  A. What is the basic difference between a control flow-oriented and a data flow-oriented design technique? Can you think of any reason as to why a data flow-oriented design technique is likely to produce better designs than a control flow-oriented design technique? **[2]**

  B. What are the symptoms of the present software crisis? What factors have contributed to the making of the present software crisis? What are the possible solutions to the present software crisis? **[2]**

  C. What is the difference between requirement analysis and specification? What are the important activities carried out during requirements analysis and specification phase? **[2]**

Q2. Answer the following:
  A. What do you mean by the term *Scrum Ceremonies*? Briefly explain any three types of scrum ceremonies? **[3]**

  B. Using one or two sentences explain the important shortcomings of the classical waterfall model that RAD and agile models of software development address. **[1]**

  C. Identify why for developing safety-critical software, the V model is usually considered suitable. **[1]**

  D. What are the major advantages of first constructing a working prototype before starting to develop the actual software? What are the disadvantages of this approach? **[3]**

Q3. Suppose you are asked to develop the following CMS software.

Course management system (CMS): A course management system is a collection of software tools providing an online environment for course interactions. A CMS typically includes a variety of online tools and environments, such as:
- An area for faculty posting of class materials such as course syllabus and handouts.
- An area for student posting of papers and other assignments.
- A grade book where faculty can record grades and each student can view his or her grades.
- An integrated email tool allowing participants to send announcement email messages to the entire class or to a subset of the entire class.
- A chat tool allowing synchronous communication among class participants.
- A threaded discussion board allowing asynchronous communication among participants.
- In addition, a CMS is typically integrated with other databases in the university so that students enrolled in a particular course are automatically registered in the CMS as participants in that course.
- The CMS is a web application for department personnel, Academic Senate, and Registrar staff to view, enter, and manage course information formerly Submitted via paper. Departments can use CMS to create new course proposals, submit changes for existing courses, and track the progress of proposals as they move through the stages of online approval.

For the above system

A. Describe the functional and non-functional requirements. **[3]**

B. Draw the context diagram and Level-1 DFD. **[3]**

C. Draw the level-2 DFD for at least one bubble obtained from Level-1 DFD. **[2]**

D. Draw the structure chart. **[3]**

E. Develop the detailed data dictionary for the DFD model created in Part (B) and (C). **[2]**

Q4. Enumerate the different types of coupling that might exist between two modules. Give examples of each. **[3]**