PMAS Arid Agriculture University Rawalpindi

University Institute of Information Technology

Midterm Examination-Fall 2023
BSCS/BSSE Morning(A/B/C)
Software Engineering (CS 205)

Registration No._____   Total Time: 60 Minutes

Maximum Points: 18

Question 01:   **(3+3 Points)**

a. Imagine you are leading a team in a software development company that has been contracted to build a mission-critical system for a space exploration project. The system involves complex algorithms for navigation, real-time data processing, and communication with satellites. The project has high stakes, tight safety regulations, and the need for a rigorous risk management approach. Safety and reliability are paramount due to the critical nature of the space exploration mission. The project must comply with rigid safety standards and regulations imposed by the space agency overseeing the mission. Documentation and traceability are crucial for regulatory approval. The project requirements are likely to evolve as more is learned about the mission and as technology advances. Early prototypes and iterations are needed to validate critical functionalities. Your task is to recommend and justify the selection of the suitable model for the development of the software system.

b. Explain the concept of iteration in the Agile process model.

Question 02:   **(4+2 Points)**

a. A multinational company with offices and employees spread across the globe is planning to implement a unified communication system to enhance collaboration and streamline communication within the organization. The company operates in various sectors, including manufacturing, research and development, and sales. The workforce is diverse, comprising on-site and remote employees. The organization recognizes the need for an advanced telecommunication system to improve real-time communication across different locations. The system should be able to establish, manage, and terminate voice and video calls. Users can send text messages, multimedia messages, and receive message notifications. Users should have access to a voicemail system. There should be secure authentication and authorization mechanisms to control access to the system. Monthly downtime of the system should not exceed 5minutes. Call setup and data transmission should have low latency to provide a real-time communication experience. The system should scale to support an increasing number of users and simultaneous connections. The system should be compatible with various devices and network infrastructures. Identify functional and non- functional requirements of the system?

b. Discuss the importance of stakeholder involvement in the requirements engineering process. How can effective communication with stakeholders contribute to successful software projects?

Question 03:   **(3+3 Points)**

You are leading the development team for a large enterprise system that involves handling a vast amount of data related to employee information, payroll, and human resources. The system is expected to have multiple modules, including employee management, payroll processing, benefits administration, and attendance tracking. The organization emphasizes the importance of a clear separation of concerns, data integrity, and the ability to integrate with various data sources. The system should also provide secure access control to ensure that only authorized users can interact with specific data.

a. Given the requirements of the enterprise system, discuss the software architectural style or styles you would recommend for this system.

b. Draw a UML Diagram for the suggested architectural style showing its use in this application.

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*****Good Luck*****