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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- May 2017

B.Tech (VIII)/M.Tech (II) Semester

COURSE CODE: 10M11CI213

MAX. MARKS: 35

COURSE NAME: ADVANCED SOFTWARE ENGINEERING

COURSE CREDITS: 3

MAX. TIME: 2 Hrs

Note: All questions are compulsory.

Q.1 [2+2+3]

- Imagine you are implementing a software-based control system. Suggest circumstances in which it would be appropriate to use a fault-tolerant architecture. Justify why this approach would be required?
- List the role and task for the System Architect.
- Develop a means to quantify and measure the maintainability attribute of a software product.

Q.2 [2+2+3]

- Is it ethical for a company to quote a low price for a software contract knowing that the requirements are ambiguous and that they can charge a high price for subsequent changes requested by the customer?
- Design an electronic form that may be used to record review comments and which could be used to electronically mail comments to reviewers.
- Give two advantages and two disadvantages of the approach to process assessment and improvement that is embodied in the process improvement frameworks such as the CMMI.

Q.3 [2+2+3]

- Assume you work for an organization that develops database products for individuals and small businesses. This organization is interested in quantifying its software development. Suggest appropriate metrics and how these can be collected.
- Is it difficult to validate the relationships between internal product attributes, such as cyclomatic complexity and external attributes, such as maintainability?
- Design a process for assessing and prioritizing process change proposals. Document this process as a process model showing the roles involved in this process. You should use UML activity diagrams to describe the process.

Q.4 [3.5 + 3.5]

- Software is increasingly being developed by teams where the team members are working at different locations. Suggest features in a version management system that may be required to support this distributed software development.
- Suggest factors that should be taken into account by engineers during the process of building a release of a large software system.

Q.5 [7]

Assume you are a software engineer working on a complex system to be developed for a large hospital chain. The system requirements include integrating hospital records of all patients, providing a means of digitizing and storing physician's reports, acquiring and displaying digital images from equipment provided by another manufacturer, and providing a local area network interconnecting physician's offices with each other and with a central file server. The hardware/software/operator system is required to allow a physician to call up an enhanced radiographic image from the central file server, evaluate the image, and dictate the report to a microphone attached to his display. The system will be required to store the report, distribute the report to the referring physician, and add the fee to the patient's bill. Further assume that you have been assigned to a team that is performing a system risk analysis. Identify and prioritize the areas of greatest technical risk.