

National University of Computer and Emerging Sciences, Lahore Campus



Course: Software Engineering
Program: BS (CS)
Duration: 60 Minutes (1 Hour)
Paper Date: 02-Oct-18
Section: All
Exam: Sessional I

Course Code: CS303
Semester: Fall 2018
Total Marks: 45
Weight: 15%
Page(s): 4

Instruction/Notes:

1. Attempt all questions on the question paper. Neither use nor submit any extra sheet.
2. You are allowed to use a single-sided, hand-written, A-4 size help sheet.

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Section _____

Roll Number: _____

Question 1 (Max. Marks = 15 = 5 x 3)

List the process model that you think will be most appropriate for the following situations. Also, list your reason(s) for choosing a particular model. If you just list the process model without mentioning the reason(s), you will not be awarded any marks.

- a. Assume that you work in a reputable software house of Lahore. A school requires a Laboratory Management System (LMS) and has contacted your company for assistance. Your company has 50 software engineers, but 40 of them are busy working on other projects. The project will be quite innovative and needs smart programmers. A school representative is willing to stay at the software house premises. The annual evaluation of the school is due soon, in which computerization initiatives will be appreciated.

Process Model:
Reason(s):

- b. Your team is starting work on a new project, but all the requirements are not clear right now. The project is a long duration project and quality of the project cannot be compromised as it may incur huge financial losses. The client requires quarterly releases and he will be providing feedback on each release.

Process Model:
Reason(s):

- c. An existing software needs to be developed in a newer and better technology and your company has been assigned this task. The software has been running successfully for a few years and does not require any major changes in its functionalities in the newer technology i.e. same functions that are available in the current version will also exist in the updated version.

Process Model:
Reason(s):

Question 2 (Max. Marks = 15)

The following table provides a high-level work breakdown structure (WBS) of project FASTFinder – an AI-based search engine. For each task, it contains information about the estimated duration (in weeks) and predecessor(s). Use this information to draw a task network (including the Start and Finish tasks). Then, use the Critical Path Method (CPM) on this task network (tasks map to nodes) to determine the minimum duration of FASTFinder, the critical path(s), the critical tasks, and the lag (a.k.a. slack) of each task. Show all of your working clearly.

Important Note: There is no partial credit in this question. Therefore, check your answers carefully.

| Task/Node | Estimated Duration (Weeks) | Predecessor(s) |
|-----------------|----------------------------|------------------------|
| Inception/Start | 0 | |
| RE A | 3 | Inception/Start |
| RE B | 6 | Inception/Start |
| RE C | 2 | Inception/Start |
| A&D A | 5 | RE A, RE B |
| A&D B | 5 | RE B, RE C |
| A&D C | 10 | RE C |
| Imp A | 7 | A&D A |
| Imp B | 4 | A&D A, A&D B |
| Imp C | 5 | A&D B, A&D C |
| Test A | 4 | Imp A, Imp B |
| Test B | 1 | Imp B |
| Test C | 5 | Imp B, Imp C |
| Delivery/Finish | 0 | Test A, Test B, Test C |

Question 3 (Max. Marks = 15)

Develop a level 0 DFD for the following scenario. Refine the DFD up to Level 1.

Video-Rental Ltd. (VRL) is a small video rental store. The store lends videos to customers for a fee, and purchases videos from a local supplier. They need a computerized system that helps them run their daily business. Description of their daily business is as follows:

Only a registered customer can borrow videos from the store. New customers register by filling out a form with their personal details and credit card details. The credit card details are used to pay subscription fee, video borrowing fees, and overdue fines. On successful payment of subscription fee, the customer is issued a membership card by VRL. The membership card has a unique membership id which is later used when borrowing videos. Each new customer's form is also added to the customer file. A customer can request a video by providing video title, his/her membership id, and payment – payment is always with the credit card used to open the customer account. If the payment is successful the customer is handed over the video by VRL. The customer then returns the video to the store after watching it. If a loaned video is overdue by a day the customer's credit card is charged, and a reminder letter is sent to the customer. Each day after that a further transaction on card is made, and each week a reminder letter is sent. This continues until either the customer returns the video, or the charges are equal to the cost of replacing the video. The local video supplier sends a list of available titles to VRL, who decides whether to send the supplier an order and payment. If an order is sent then the supplier sends the requested videos to the store. For each new video a new stock form is completed and placed in the stock file.

DFD Level 0

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Name: _____

Roll Number: _____

Section

DFD Level 1
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