Cluster Innovation Centre, University of Delhi, Delhi-110007

Examination : End Semester Examination – Nov/Dec 2021
Name of the Course : B. Tech. IT & Mathematical Innovation
Name of the Paper : VII.3 Software Project Management
Paper Code : 911712
Semester : VII
Duration : 3 hours
Maximum Marks : 75
Instructions:
1. This question paper contains 2 printed pages.
2. Attempt **any four** questions. All questions carry equal marks.

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1. Discuss all the essential Project Manager skills to execute Software project timely and in cost-effective way meeting the specifications and quality standards.

2. Consider the given code:

```
i = 0;
n=4;
while (i<n-1) do
j = i + 1;
while (j<n) do
if A[i]<A[j] then
swap(A[i], A[j]);
j- -;
end do;
i=i+1;
end do;
```

Answer the following:

a. Draw a flowgraph for the above code.

b. Find the cyclomatic complexity value from the flowgraph.

c. Find all the independent paths forming the basis set.

3. You have given the different project activities and time allocation details, estimate the time for each tasks using PERT:

Table 1. Project Activities and Time Allocation Details

Tasks	Time Allocation (person days)	Planned Start	Planned End
Requirement analysis and project planning	10	01/01/2002	01/14/2002
Setting up the environment	6	01/01/2002	01/08/2002
Software construction	80	01/15/2002	05/15/2002
Unit testing	30	05/16/2002	06/28/2002
User training	5	07/22/2002	07/26/2002
System testing	15	07/01/2002	07/19/2002
User documentation	30	01/15/2002	02/28/2002
Data migration	20	01/15/2002	02/15/2002
Conducting user acceptance test	20	08/01/2002	08/31/2002

Table 2. Optimistic, Most Likely Time, and Pessimistic Estimates for Activities

Tasks	Optimistic Time Estimates (person days)	Most Likely Time Estimates (person days)	Pessimistic Time Estimates (person days)
Requirement analysis and project planning	7	10	13
Setting up the environment	3	6	9
Software construction	48	83	100
Unit testing	20	28	33
User training	4	5	6
System testing	10	15	20
User documentation	23	28	45
Data migration	18	18	30
Conducting user acceptance test	14	21	22

4. Using COCOMO II model, estimate the effort required to build software that produces 12 screens, 10 reports and will require 80 3GL components. Assume that the complexity is difficult with weights as 3, 8, 10 respectively and the productivity rate is 13. The software is developed using component base development process model and hence 30% of the component are reused.

5. It is required to develop an automated system for a pharmaceutical company. The company management is not clear about their requirements rather they expect their requirements to be changing continuously. Therefore, there is a huge amount of risk of changing requirements involved at each step. Moreover, a high probability is also there to go back to address mistakes. For that it may need to plan again about further development of project. In this regard the project management team may go for more iteration before finalizing the project. Which of the following is a better choice among the two process models (Waterfall/Spiral) to apply for the given scenario by the project management team? Briefly explain the reason of your choice.

6. Consider the following case study:

Managing Risks: Case Study

Consider a scenario. Your organization is a vendor of software solutions. A bus transport company the US wants you to develop a Schedule Adherence system. The team that will develop this software is new and the platform selected for development is also new to your organization. The project team needs to be trained intensively for this.

During this project, the team is expected to manage a large volume of data. The team has never had any experience in managing such a large volume of data. The system also needs to use this data to generate various MIS reports related to delays or adherence of bus services.

The performance requirement is less than fifteen seconds for all popular browsers. Your organization is anticipating numerous requirement changes during the development process. The system needs to be implemented across several states in the country. The data related to the system is highly confidential because it can provide an edge to the competitors.

Now, as a project manager, you need to prepare a risk management plan for this project. The project starts on May 15 and should be completed on November 15.