

BE6-R3: SOFTWARE PROJECT MANAGEMENT

NOTE:

1. Answer question 1 and any FOUR questions from 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Time: 3 Hours

Total Marks: 100

1.
 - a) Draw a labelled schematic diagram to represent the spiral model of software development. Is the number of loops of the spiral fixed? If your answer is affirmative, write down the number of the loops that the spiral must have. If your answer is negative, explain how the number of loops of the spiral is determined for a project.
 - b) Do you agree with the statement: "Development of a software product using the prototyping life cycle model always costs more than development of the same product using the iterative waterfall model, since additional cost is incurred to construct a throw-away prototype." Justify your answer.
 - c) What do you understand by product visibility in the context of software development? Why is it important to improve product visibility during software development?
 - d) As a project manager would it be worthwhile on your part to reduce the project duration by half? Assume that the customer agrees to pay for the increased manpower requirements. Explain your answer.
 - e) Do you agree with the statement: "When a task along a critical path is completed in less time than originally estimated, it should show up as faster completion of the project." Explain your answer.
 - f) Using a schematic diagram, show the order in which the following are estimated in the COCOMO estimation technique:
cost, effort, duration, size.
 - g) Explain the attributes of a software product that determine its quality.

(7x4)

2.
 - a) Explain how Putnam's model can be used to compute the change in project cost with project duration. What are the main disadvantages of using the Putnam's model to compute the additional costs incurred due to schedule compression? How can you overcome these problems?
 - b) What are the disadvantages of using LOC (Lines of Code) to estimate the size of a software product? Does function point metric overcome these problems? Explain your answer.

(9+9)

3.
 - a) In what units you can measure the productivity of a software development team. List three important factors that affect the productivity of a software development team.
 - b) Schedule slippage is a very common form of risk that almost every project manager has to encounter. Explain in 3 to 4 sentences how you would manage the risk of schedule slippage as the project manager of a medium-sized project.
 - c) Why is it necessary for a project manager to decompose the tasks of a project using Work Breakdown Structure (WBS)? To what granularity level the tasks are decomposed. Explain your answer.

(6+6+6)

- 4.**
- a) What do you understand by a "critical path" in a project schedule? Can there be more than one critical path in a project schedule? Why is it important for the project manager to identify the critical paths in a project schedule? How can a project manager ensure that tasks on the critical path complete as per schedule?
 - b) Suppose that software product for business application costs Rs. 250,000/- to buy off-the-shelf and that its size is 40 KLOC (Kilo Lines Of Code). Assuming that in-house engineers cost Rs.20,000/- per programmer-month (including overheads), would it be more cost-effective to buy the product or build it? Which elements of the cost are not included in COCOMO estimation model? What additional factors should be considered in making the buy/build decision?

(9+9)

- 5.**
- a) Suppose you have been appointed as the project manager of a large project, identify the activities you would undertake to plan your project. Explain the sequence in which you would undertake these activities by using a flow chart notation. What are some of the factors which make it hard to accurately estimate the cost of software projects?
 - b) Suppose you are the project manager of a large development project. The top management informs that you would have to do with a fixed team size (i.e. constant number of engineers) through out the duration your project. What will be the impact of this decision on your project? Explain your answer.

(9+9)

- 6.**
- a) Explain, how the management of an object-oriented development project would differ from a traditional project.
 - b) List three major types of risks that a typical software project would face. Suppose you are the project manager of a large software development project, point out the main steps you would follow to manage risks in your software project.

(9+9)

- 7.**
- a) What is the difference between process and project metrics? Give at least two examples of each. Briefly indicate how these metrics can be applied to project management.
 - b) What do you understand by project closure analysis and how is it conducted? What is the use of having project closure analysis?

(9+9)