B5.1-R4: SOFTWARE PROJECT MANAGEMENT

NOTE:

1. **Answer question 1 and any FOUR from questions 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) Briefly describe the important activities through which risk assessment is carried out by a project manager?

b) Identify any four major activities that a project manager undertakes to plan a project.

c) What are the different parameters of a software development project based on which its size in unadjusted function points (UFP) is computed?

d) Identify two main reasons as to why the requirements for a software development project might change after the project has started. In which software life cycle model can such changes be handled well?

e) Staff time is usually the principal cost component of any software development project. Describe four other aspects on account of which project costs could arise?

f) Identify at least two important reasons as to why embedded software development is much more challenging as compared to the development of a management information system.

g) Identify at least three reasons as to why it is difficult to accurately estimate project costs and duration?

(7x4)

2.

a) What do you understand by project management life cycle? Schematically depict the phases of project management life cycle and their precedence relationships. Briefly describe the phases of project management.

b) Identify at least four important activities that a project manager undertakes to schedule a project.

c) Identify five reasons that are commonly attributed for software project delays.

(9+4+5)

3.

a) What do you understand by software process modeling? What are the principal elements of a process model? What are the uses of software process modeling? What are the principal software process modeling approaches?

b) What does the quality parameter ``fitness of purpose'' mean in the context of software products? Why is this not a satisfactory criterion for determining the quality of software products? Explain McCall's quality parameters.

(9+9)

4.

a) Compare the weaknesses and strengths of ISO 9000, SPICE, and CMMI models.

b) A software package is required by a company to keep track of employee work hours. Its size is estimated to be 30KLOC. Assume that competent developers can be hired at Rs.50,000/- per month. However, commercial offering supporting almost all of the required features costs Rs. 100,000/-. In this situation, should the company buy or build the software? Write all the factors that the company needs to consider before making the buy versus build decision.
You can make use of the following COCOMO formula supplied to you:

Organic:	Effort=2.4*(KLOC)$^{1.05}$ PM	Development time= 2.5(Effort)$^{0.38}$ months
Semidetached:	Effort=3.0*(KLOC)$^{1.12}$ PM	Development time= 2.5(Effort)$^{0.35}$ months
Embedded:	Effort=3.6*(KLOC)$^{1.20}$ PM	Development time= 2.5(Effort)$^{0.32}$ months

where, KLOC means Kilo Lines of source Code, and PM is effort in person month units.

(8+10)

5.

a) Discuss the various techniques that project managers can use to ensure knowledge and lessons learned from previous projects are not lost, and can be shared for the benefit of future projects.

b) What do you understand by the term project milestone? How would you decide how many milestones to show on your project plan?

c) Suppose you as a project manager notice that your project is behind schedule and you are considering adding extra staff to the team. What would be the potential advantages and disadvantages of this approach?

(8+5+5)

6.

a) Briefly discuss the different categories of techniques that are available for project cost estimation and comment on their accuracy.

b) Write at least four consequences of failing to develop a written project plan.

c) For each of the following objectives, state a metric you would use to help in achieving the objective. Also state whether it is a product or process metric, and explain how it would be applied.

i) Avoid project schedule delays
ii) Measure continuous quality improvement from one project to the next
iii) Identify software parts that are exhibiting quality problems
iv) Establish a baseline for improving schedule accuracy
v) Identify progress achieved in testing phase

(4+4+10)

7.

a) Compare and contrast the project evaluation and review technique (PERT) with the critical path method (CPM).

b) For the following, Use the information in the following Table, and assume that the project team will work a standard working week (5 working days in 1 week) and that all tasks will start as soon as possible:

i) Determine the critical path of the project.
ii) Calculate the planned duration of the project in weeks.
iii) Identify any non-critical tasks and the float (free slack) on each.

Task	Description	Duration(Working Days)	Predecessors
A	Requirement Analysis	5	
B	Systems Design	15	A
C	Coding	25	B
D	Communication Setup	15	B
E	Hardware Installation	30	B
F	Integration	10	C, D
G	System Testing	10	E, F
H	Training/Support	5	G
I	Handover	5	H

(6+12)