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) Identify a suitable life cycle model for developing a software product using the Object-Oriented paradigm. Justify your answer.

(b) Explain the Function Mark II metrics for project size.

(c) What are the different types of risks involved in a software project ? Enumerate and discuss briefly.

(d) Explain the reasons why adding more manpower to a late project makes it worse.

(e) What do you mean by project auditing ? Why is it required ? Who carries out the project auditing ?

(f) What is risk identification ? Describe the difference between risk components and risk drivers.

(g) Explain how Putnam's model can be used to compute the change in project cost with project duration.

(7 × 4)

2. (a) Consider a project with the following functional units:

Number of user inputs = 50

Number of user outputs = 40

Number of user enquiries = 35

Number of user files = 06

Number of external interfaces = 04

Assume all complexity adjustment factors and weighting factors are average. Compute the function points for the project.

(b) 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 ?

(c) In which units can you measure the productivity of a software development team ? List three important factors that affect the productivity of a software development team.

(9 + 6 + 3)

3. (a) What are GANTT Charts ? Explain with an example. What can be applications of GANTT chart ?

(b) What is a Quality Factor ? Briefly explain McCall's quality factors.

(c) Briefly explain the CMM architecture. Briefly explain the five maturity levels in the CMM model.

(6 + 6 + 6)

4. (a) Consider a large-scale project for which the manpower requirement is K=600 PY and the development time is 3 years 6 months. (a) Calculate the peak manning and peak time. (b) What is the manpower cost after 1 year and 2 months ?

(b) A garage maker is going to produce a new garage. These are the tasks that have to be done by the garage maker and his assistants and the times they will take:

	Activity	**Duration in days**
A	prepare foundations	7
B	make and position door frame	2
C	lay drains, floor base and screed	15
D	install services and fittings	8
E	erect walls	10
F	plaster ceiling	2
G	erect roof	5
H	install door and windows	8
I	fit gutters and pipes	2
J	paint outside	3

What precedence relations you can logically derive from tasks. List them all. Construct an appropriate activity network to illustrate the information.

(c) Define software reliability and describe two measures of reliability.

(6 + 9 + 3)

5. (a) Development of a new deluxe version of a particular software product is being considered. The activities necessary for the completion of this project are listed in the table below along with their costs and completion times in weeks.

Activity	Normal Time	Crash Time	Normal Cost	Crash Cost	Immediate Predecessor
A	4	3	2,000	2,600	-
B	2	1	2,200	2,800	A
C	3	3	500	500	A
D	8	4	2,300	2,600	A
E	6	3	900	1,200	B, D
F	3	2	3,000	4,200	C, E
G	4	2	1,400	2,000	F

(i) What is the project expected completion date ?

(ii) What is the total cost required for completing this project on normal time ?

(iii) If you wish to reduce the time required completing this project by 1 week, which activity should be crashed, and how much will this increase the total cost ?

(b) Who is a Software Project Manager ? Give its responsibilities in a Project. What are Software Management Activities ?

(c) What is the role of Joint Planning Sessions in Project Management ?

(9 + 6 + 3)

6. (a) Discuss three reasons of delays in Software Projects.

(b) What are the steps to be performed for measuring Risk Projection ? What are the components of Risk Table ?

(c) Consider a project to develop a full screen editor. The major components identified are:

(I) Screen edit

(II) Command Language Interpreter

(III) File Input & Output

(IV) Cursor Movement

(V) Screen Movement

The sizes of these are estimated to be 4k, 2k, 1k, 2k and 3k delivered source code lines. Use COCOMO to determine:

(i) Overall cost and schedule estimates (assume values for different cost drivers, with at least three of them being different from 1.0)

(ii) Cost & Schedule estimates for different phases.

(3 + 5 + 10)

7. (a) Which metrics are used for estimating WebApp Projects ? Briefly discuss each of them.

(b) Construct a precedence network based on the same activity descriptions below. Show all your work. Label activities in the network by their activity letters and node numbers. Remove all redundant dependencies and arrange activities in proper sequence steps.

- Activity I follow Activity B and precede Activity Q.
- Activity B1 precedes Activity P and follows the completion of Activities Q, K2, and E.
- Activity R follows the completion of Activity B.
- Activity S2 follows Activities R and S1, and precedes Activity P.
- Activity K3 is preceded by Activities X, L, and Z, and followed by Activities G and F.
- Activity E2 precedes Activities A1, X, L, and Z.
- Activity B can start when Activities A1 and X are completed.
- The predecessors to Activity S1 are Activities E, G, and F.
- Activity E depends on Activity L and E2 and precedes Activities N2, S1, and K2.
- Activity K2 follows Activities N2, R, and L.
- Activity P depends on Activities R and N2.
- Activity S2 depends on Activities X, F, and E2.

(6 + 12)