INF3708

May/June 2013

SOFTWARE PROJECT MANAGEMENT

Duration   2 Hours

100 Marks

EXAMINATION PANEL AS APPOINTED BY THE DEPARTMENT

Use of a non-programmable pocket calculator is permissible.

Closed book examination

This examination question paper remains the property of the University of South Africa and may not be removed from the examination venue

INSTRUCTIONS

- **This paper consists of 6 pages.**
- Non-programmable calculators may be used
- Show all calculations
- Round off all your calculations to two decimal places
- Answer ALL the questions

GOOD LUCK!!

QUESTION 1 [10]

Define the following terms in the context of Software Project Management
1.1	Project	(2)
1 2	Planning	(2)
1.3	Net profit	(2)
1.4	Payback period	(2)
1 5	Risk	(2)

QUESTION 2 [20]

2 1   Briefly discuss four characteristics of software projects which make software project management particularly difficult in comparison to general project management.   (8)

2.2   Briefly discuss the following three successive processes that bring a new system into being.
2 2 1	Feasibility study	(2)
2 2 2	Planning	(2)
2.2.3	Project execution	(2)

2 3   List the three conditions under which a project is considered successful   (3)

2 4   Briefly define the term "*Project portfolio management*" in the context of Software Project Management.   (3)

QUESTION 3 [7]

3 1   Table 3 1 below shows cash flow projection of two projects As a software project manager, you are restricted to only implement one project. Which one of the two projects would you choose for implementation based on the *projected cash flows*? Explain your selection criterion   (3)

Year	Project 1	Project 2
0	-100,000	-100,000
1	10,000	30,000
2	10,000	30,000
3	10,000	30,000
4	20,000	30,000
5	100,000	30,000
Net profit	50,000	50,000

TABLE 3.1 Two project cash flow projections – figures are end of year totals (£)

3 2   Assuming a 10% discount rate as shown in Table 3 2 below, and using project cash flow projections in Table 3 1, calculate the Net Present Value (NPV) for project 1   (4)

Year	Discount factor @ 10%
0	1 0000
1	0.9091
2	0.8264
3	0.7513
4	0 6830
5	0.6209

TABLE 3.2 NPV discount factors

QUESTION 4   [8]

4 1   Briefly discuss the following process models in the context of Software Project Management

4 1 1 Waterfall model	(2)
4 1 2 Spiral model	(2)

4 2   Briefly discuss the following classifications of prototypes

4 2 1 Throw-away prototypes	(2)
4 2 2 Evolutionary prototypes	(2)

QUESTION 5   [9]

5 1   Briefly explain the following software project effort estimation laws

5 1 1 Parkinson's Law	(2)
5 1 2 Brooks' Law	(2)

5 2   Three systems with the following estimated lines of code were identified   Determine how many years it will take to complete **system A**, using the Boehm's equation for calculating effort in the use of the COCOMO model $(effort = c* (size)*^{k})$ (5)

System	Lines of code	System type
A	10000	Embedded mode
B	11000	Semi-detached mode
C	12000	Organic mode

TABLE 5.1 System details

System type	c	k
Organic	2 4	1 05
Semi-detached	3 0	1 12
Embedded	3 6	1 20

TABLE 5.2 COCOMO constants

[TURN OVER]

6 1   Draw an **activity-on-node** network based on the activities with their precedents and
durations given in Table 6 1 , and determine the critical path   (12)

Activity	Duration	Precedents
A	6	None
B	4	None
C	3	A
D	4	B
E	3	B
F	10	None
G	3	E, F
H	2	C, D

TABLE 6.1 Activity information

7 1   Briefly define the following choices of dealing with risks
    7 1 1   Risk acceptance   (2)
    7 1 2   Risk avoidance   (2)
    7 1 3   Risk reduction and mitigation   (2)
    7 1 4   Risk transfer   (2)

7 2   In the PERT network illustrated in the Figure 7 1 below, the targeted date for the
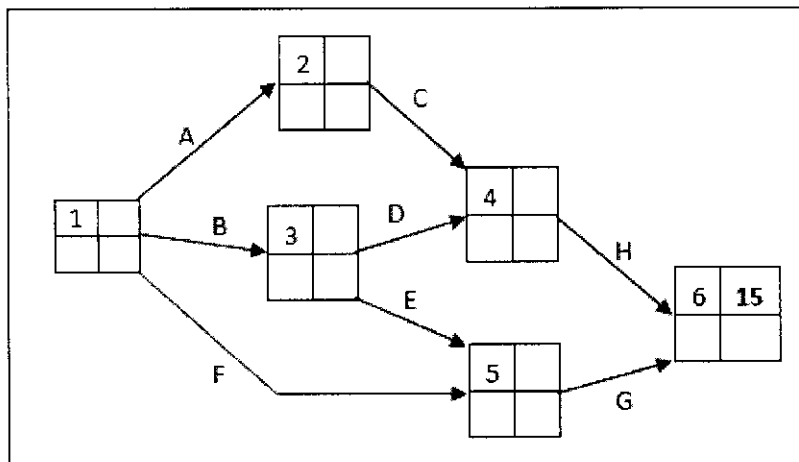completion of the project is fifteen (15) weeks

FIGURE 7 1 PERT network diagram

Activity	Optimistic (a)	Most Likely (m)	Pessimistic (b)	Expected (t_e)	Standard Deviation (s)
A	5	6	8		
B	3	4	5		
C	2	3	3		
D	3 5	4	5		
E	1	3	4		
F	8	10	15		
G	2	3	4		
H	2	2	2 5		

TABLE 7.1 Values for the PERT network

Use the Table 7 1 and the Figure 7 1 above to calculate the following

7 2 1   Calculate the expected times (t_e) for all activities.   (4)

7.2.2   Calculate the standard deviation (s) for all activities.   (4)

7 2 3   Use Figure 7 1 to calculate the standard deviation (s) for the fourth (4) task
(event)   (3)

7.2.4   Use Figure 7.1 to calculate the standard deviation (s) for the sixth (6) task
(event)   (4)

7 2 5   According to Figure 7.2 below, what is the probability of not meeting the
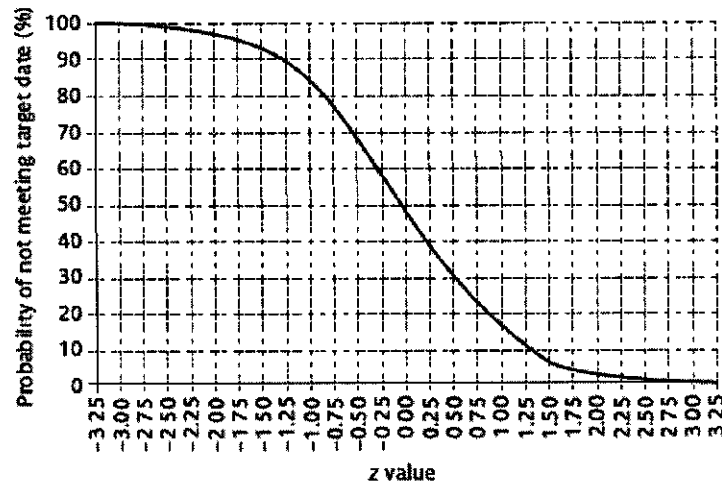target date?   (1)

FIGURE 7.2 The probability of obtaining a value within z standard deviations of the mean for a normal distribution

QUESTION 8 [10]

8 1 Briefly discuss the following general categories of costs·
    8 1 1 Staff costs (2)
    8 1 2 Overheads costs (2)
    8 1.3 Usage charges (2)

8 2 Besides Slip Charts, what are the other techniques for visualizing progress of projects? List and briefly discuss any other two such project progress visualization techniques (4)

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