INF3708

May/June 2015

SOFTWARE PROJECT MANAGEMENT

Duration   2 Hours

80   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!!

Select the appropriate answer· Write only the appropriate letter next to the question number in your answer book

1 1	Planned activities contain the following: A End dates B. Resource allocation C Start date D All of the above E None of the above
1 2	The first step in software project planning is to A. Determine the budget of the project B Select an organisational model for team work C Determine the project constraints D Establish the objectives and scope of the project E None of the above
1 3	The basis of successful project management is A. Identifying the project stake holder's objectives B Ensuring that these objectives are met C Accurate information D. All of the above E None of the above
1 4	Net profit is calculated as follows: A Adding total cash inflows to the initial investment B. Adding total expenses to the initial investment C. Deducting total cash inflows from total cash outflows D Deducting total expenses from total income E. Deducting total expenses from the initial investment
1 5	When calculating payback period the following needs to be taken into consideration. A The initial investment B Whether cash inflows are received at the end or the beginning of the period C. The interest rate D A & B E. A, & C

QUESTION 2 [28]

2 1   Discuss prototyping   When can this method be used for optimal results and to reduce risks?
(5)

2 2   The table below gives the estimated cash flow for three different projects (in South African rand, R)

Year	Project 1	Project 2	Project 3
0	- R 175 000	- R 150 000	- R 300 000
1	+ R 15 000	+ R 5 000	+ R 30 000
2	+ R 20 000	+ R 15 000	+ R 30 000
3	+ R 50 000	+ R 20 000	+ R 50 000
4	+ R 50 000	+ R 30 000	+ R 120 000
5	+ R 50 000	+ R 60 000	+ R 120 000
6	+ R 50 000	+ R 90 000	+ R 120 000

Table 1 for Question 2.2

a)   Give the formula to calculate <u>Net Profit</u> Calculate the Net Profit of all the projects. Which of the projects have the highest Net Profit? (4)

b)   Give the formula to calculate <u>Return on Investment</u> Calculate the Return on Investment (ROI) of all the projects Which of the projects have the highest return on investment? (6)

c)   Give the formula to calculate the <u>pay back period</u>. Calculate the pay back period of all the projects Which of the projects pay back the quickest? (4)

d)   Calculate the net present values of all the projects using a discount factor of 10%. Which project has the best NPV? (9)

Year	8% discount rate	10% discount rate	12% discount rate
0	1	1	1
1	0 9259	0 9091	0.8929
2	0.8573	0 8264	0 7972
3	0 7938	0 7513	0 7118
4	0 735	0.683	0 6355
5	0 6806	0 6209	0 5674
6	0 6302	0 5645	0 5066

Table 2 for Question 2 2. Table of Nett Present Value Discount Factors

QUESTION 3   [20]

Refer to the PERT activity timetable in table 3 and answer the questions that follow.

Activity	Optimistic (a)	Most Likely (m)	Pessimistic (b)	Expected (t_e)	Standard deviation (s)
A	4	5	6		
B	2	3	4		
C	3	4	5		
D	5	6	7		

Table 3 for Question 3

3 1   Calculate the Expected times (t_e) for activities A, B, C and D.   (4)

3 2   Calculate the Standard Deviation (s) for activities A, B, C and D   (4)

3.3   Use Figure 1 below as well as the (t_e) and (s) values calculated in Questions 3 1 and 3.2 above
      and calculate the values for (i), (ii), and (iii) in Figure 1   (3)

3 4   Use the calculations done in Questions 3 1, 3 2 and 3 3 above together with the calculated value
      for (iv), to determine the Z value for the fourth (4th) task   (7)
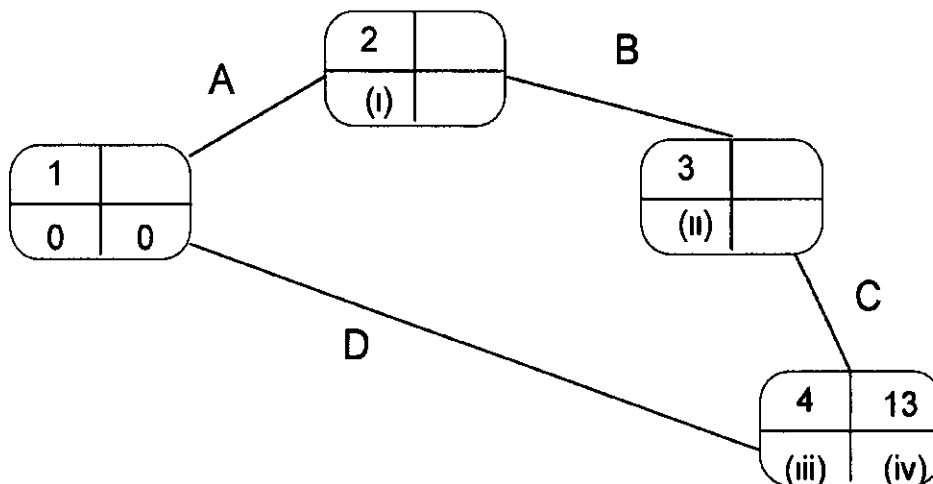

Figure 1 for Question 3: PERT network diagram

3 5   According to the figure 2, what is the probability of not meeting the target date?   (2)
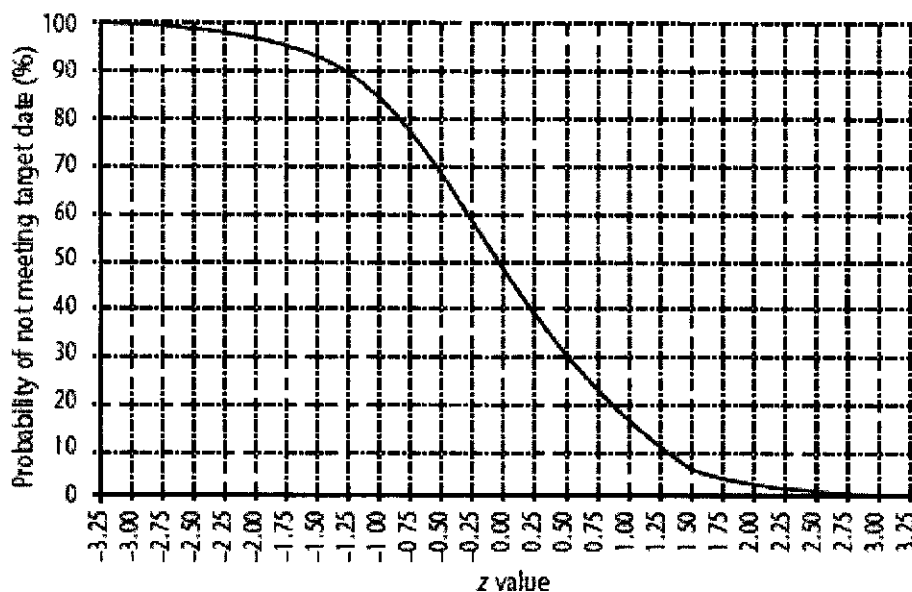
100
90
80
70
60
50
40
30
20
10
0

Probability of not meeting target date (%)

-3.25 -3.00 -2.75 -2.50 -2.25 -2.00 -1.75 -1.50 -1.25 -1.00 -0.75 -0.50 -0.25 0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25 2.50 2.75 3.00 3.25

z value

Figure 2 for question 3

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

4 1   Discuss the difference between *activity-on-arrow* and *activity-on-node*   (4)

4 2   Consider the following list of tasks with dependencies and estimated durations reflected in table 4.
      Draw the activity-on-node network (precedence network) diagram for the tasks as given in table
      4 Indicate all the values on the nodes Indicate the critical path with an * on each task in the path
      (13)

Task	Precedents	Duration (weeks)
A	None	5
B	A	9
C	None	4
D	A	2
E	C	5
F	B	6

Table 4 for Question 4.2

QUESTION 5 [10]

5 1   The staff cost of the Omega Project is shown below Peter is the leader of the Omega project and
      will spend 10 extra days on the project to plan and carry out the post project review The project
      is scheduled to be finished in 20 days   An amount of R50 per day is charged by the Omega team
      for overhead costs Marie will work on the project every day, Susan and Amy will work only
      half of the days and Juan will work only 5 days

Staff member	Daily cost
Peter	R400
Susan	R200
Juan	R300
Marie	R400
Amy	R300

Table 5 for Question 5 1

Calculate the total cost for the Omega project   (10)

EXAMINERS·
FIRST   MR EO OCHOLA
SECOND   MR M MALOMA
EXTERNAL PROF MO OHANGA