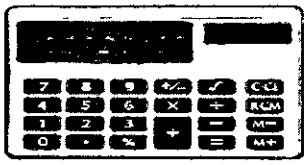
UNIVERSITY EXAMINATIONS



UNIVERSITEITSEKSAMENS

UNISA university of south africa

INF3708

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SOFTWARE PROJECT MANAGEMENT

Duration 2 Hours

80 Marks

EXAMINERS

FIRST :	MR EO OCHOLA
SECOND	MR MC MALOMA
EXTERNAL	PROF MO OHANGA

Use of a non-programmable pocket calculator is permissible

Closed book examination.

INSTRUCTIONS

- **This paper consists of 5 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 [5]

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

1 1	Activity networks represent the time component of a PFD as follows: A. The time to develop each product in the PFD B. The total time to develop various product instances C. The total time to complete the PFD D. The total duration of all individual tasks to produce each product E. None of the above
1.2	Which of the following is FALSE regarding the feasibility study? A. It investigates whether a prospective project is worth starting. B. Planning can take place when the feasibility study results indicate that the prospective project appears unviable. C. It makes the client and other stakeholders aware of the problems they wish to overcome. D. The probable developmental and operational costs will be estimated. E. The feasibility study could be treated as a project on in its own right with a large system
1.3	Indicate which of the following may NOT be delayed until later in the project when more information is available: A. Ideal activity networks B. PBS C. PFD D Product instances E. A, B & C
1.4	Net Present Value takes into consideration the following items: A. Cash flow, DCF and IRR B. Net Profit, discount rate and IRR C. Cash flow timing, discount rate and net profit D. DCF and IRR, net profit E. Cash flow, IRR, net profit
1 5	Evolutionary software process models. A. Are iterative in nature. B. Can easily accommodate product requirements changes. C. Do not generally produce throw-away systems. D. A & B E. A, B & C

QUESTION 2 [20]

2.1 Discuss four different criteria that can be used in assessing and evaluating a project. (8)

2.2 The cash flows of two projects are given in table 1 below:

Year	Project 1	Project 2
0	-250000	-300000
1	25000	25000
2	25000	50000
3	50000	75000
4	50000	50000
5	100000	50000
6	100000	75000

Table 1 for Question 2.2

a) Give the formula to calculate Net Profit Calculate the Net Profit of all the projects. Which of the projects have the highest Net Profit? (3)

b) Give the formula to calculate Return on Investment Calculate the Return on Investment (ROI) of all the projects. Which of the projects have the highest return on investment? (3)

c) Give the formula to calculate the pay back period Calculate the pay back period of all the projects Which of the projects pay back the quickest? (3)

d) Calculate the net present values of all the projects using a discount factor of 8%. Which project has the best NPV? (3)

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 [16]

3.1 Provide Boehm's equation for calculating effort in the use of the COCOMO model and provide a brief description of each of the components of the model. (4)

3.2 Kotze Ltd needs to estimate the number of work hours required to develop a software project. They decide to use the COCOMO model. Company employees are assumed to work 8 hours per day, 19 days per month. The SLOC was calculated to be 120,000 The system interface

requirements are flexible You are required to calculate the number of working hours required to develop the software project Indicate all formulas and workings. (8)

System type	c	k
Organic	2.4	1 05
Semi-detached	3	1 12
Embedded	3 6	1.2

Table 3 for Question 3.2· COCOMO constants

3 3 Briefly identify and explain Brooks' and Parkinson's laws. (4)

QUESTION 4 [17]

4.1 When presenting the activities of a project using an activity-on-node network (precedence network) diagram, a block divided into 7 sub-areas will be used. Give an example of the block with the labelling conventions as used by Hughes and Cotterell. (2)

4.2 Consider the following list of tasks with dependencies and estimated durations reflected in the table, and then draw the activity-on-node network (precedence network) diagram with all its nodes' entries completed Determine the total duration of the project as well as the critical path(s) and indicate it (them) with a * on each task in the path (15)

Task	Precedents	Duration (weeks)
A	None	6
B	None	7
C	None	28
D	B	7
E	A	6
F	A	9
G	D, E	5
H	F,G	8

Table 4 for Question 4.2

QUESTION 5 [12]

5 1 When planning for risks, there are four steps to be followed. Discuss these steps briefly (8)

5.2 For each of the following project risks, list one (1) risk reduction technique
- Personnel shortfalls
- Unrealistic time and cost estimates
- Developing the wrong user interface
- Real-time performance shortfalls (4)

QUESTION 6 **[10]**

6 1 The labour costs of the X-Programming Project are shown below The project is scheduled to be completed in 50 days. An amount of R250 per day is charged by the programming team towards overhead costs for the days scheduled Peter and Charlotte are both the project leaders and will spend an additional week on the project to plan and carry out the post project review Peter will spend an extra 4 days with the marketing strategy Sam will work on the project every day Jane and Adam will work mornings (5 hours) only and Bess will work only 1 week. (You can take a workday to consist of 8 hours, and a workweek to consist of 5 days, thus 8*5=40 hours per week)

Staff Members	**Hourly Cost**
Peter	R 400
Charlotte	R 450
Jane	R 330
Sam	R 150
Adam	R 200
Bess	R 250

Table 5 for Question 6 1

Calculate the cost of the X-Programming Project. (8)

6 2 When will a project be considered successful? (2)