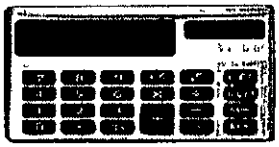
UNIVERSITY EXAMINATIONS



UNIVERSITEITSEKSAMENS

UNISA university of south africa

INF3708

October/November 2011

SOFTWARE PROJECT MANAGEMENT (INFORMATION SYSTEMS)

Duration 2 Hours

80 Marks

EXAMINATION PANEL AS APPOINTED BY THE DEPARTMENT

Use of a non-programmable pocket calculator is permissible

This paper consists of 7 pages

INSTRUCTIONS

- Non-programmable calculators may be used
- Show all calculations
- Round off all your calculations to two decimal places

GOOD LUCK!!

QUESTION 1 [15]

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

1.1	_____ is the composition of Software Project Management scope where normally an outline plan is formulated for the entire project and detailed plans for each phase of the project as they are encountered. This may include, but are certainly not limited to, work- and product breakdown structures (for the entire project as well as per phase), quality standards, risk management and change control procedures, resource allocation, time management and costing calculations. A. Project Feasibility B Project Initiation C Project Planning D. Project Execution E Project Control
1.2	When producing a system in a project, different models can be chosen. The following are advantages of one of the process models i Large projects may benefit from the limited iteration process allowed ii Logical flow aids in understanding iii Sequential project processes are easier to plan and implement iv Allows project completion times to be forecast with a relative degree of accuracy v It is relatively simple and easy to understand vi Enables allocation of tasks within a phase vii The progress can be evaluated at the end of each phase Which of the process model has the above advantages? A Waterfall model B Spiral model C Rapid Application Development (RAD) D Component-Based Development (CBD) E 'b' Model
1.3	According to Hughes and Cotterell, methods and plans differ in the following way A Methods are normally based on plans B. Methods relate to activities in general and plans relate to real activities C Plans are usually based on initial activities. D Plans relate to activities in general and methods relate to real activities E 1 & 2
1.4	The linear sequential model of software development is also known as the: A Classical life cycle model. B Fountain model. C Spiral model. D Chaos model E None of the above.

1 5	Projects must be evaluated on the following grounds· A strategic, political and economical grounds B strategic, technical and cultural grounds C technical and economical grounds D strategic, technical and economical grounds E None of the above

QUESTION 2 [4]

Name and briefly discuss the four characteristics identified by Brooks where software projects are the same as well as different from general or other types of project (4)

QUESTION 3 [22]

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	- R195 000	- R160 000	- R295 000
1	+ R15 000	+ R15 000	+ R30 000
2	+ R30 000	+ R15 000	+ R35 000
3	+ R55 000	+ R20 000	+ R50 000
4	+ R50 000	+ R35 000	+ R120 000
5	+ R55 000	+ R55 000	+ R110 000
6	+ R50 000	+ R90 000	+ R115 000

Table 3 1 for Question 3

Based on the above table, answer the following questions

3 1 Calculate the **net profit** of each project. (3)

3 2 Based on your answer to Question 3 1 above, identify which project you would select to develop Motivate your answer (1)

3 3 Using the **shortest payback** method, identify which project you would now select for development Justify your answer by referring to the projects' payback periods and possible profits in the payback year. (4)

3 4 Calculate the **return on investment** *(ROI)* of each of the projects given in Table 3 1 (6)

3 5 Based on your calculation of the ROI of each project in Question 3 4 above, identify which project you would select to develop (1)

3 6 Assume a *discount rate* of 10% Calculate the *Net Present Value (NPV)* of the each project Use the 10% discount rate from Table 3 2 given below (6)

Year	10% discount rate
1	0 9091
2	0 8264
3	0 7513
4	0 6830
5	0 6209
6	0 5645

Table 3 2 Table for Question 3 6

3.7 Based on your calculation of each project's NPV, which project would you now select for development? In general, what conclusion do you reach regarding the viability of these projects? (Base your answer on the NPVs of each project) (1)

QUESTION 4 [20]

4 1 There are a number of different conventions that have been adopted for entering information on network and activity planning diagrams, such as activity-on-arrow networks and the Precedence or activity-on-node network diagrams Give the naming convention of events for activity-on-arrow networks **as well as** for the nodes in Precedence (or activity-on-node network) diagram as used in Hughes & Cotterel (4)

4 2 Consider the following activities with their precedents and durations

Activity	Precedents	Estimated duration (days)
A	None	34
B	A	20
C	A	15
D	C	25
E	B	12
F	D, E	7
G	D, E	6
H	F	30
I	G	28
J	I, H	6

Draw a complete Precedence network (Activity-on-node) diagram Use the naming convention for nodes as used in Hughes & Cotterel, which is based on the British Standard BS 4335 (see figure below) Complete both a forward and backward pass to

determine the total duration and critical path (12)

Early Start	Duration	Early Finish
Task Name		
Late Start	Slack	Late Finish

4 3 List all the paths with their total durations based on the drawn complete Precedence network (Activity-on-node) diagram in question 4 2 above (4)

QUESTION 5 [14]

In the PERT network illustrated in the figure below, the targeted date for the completion of the project is nine (11) weeks

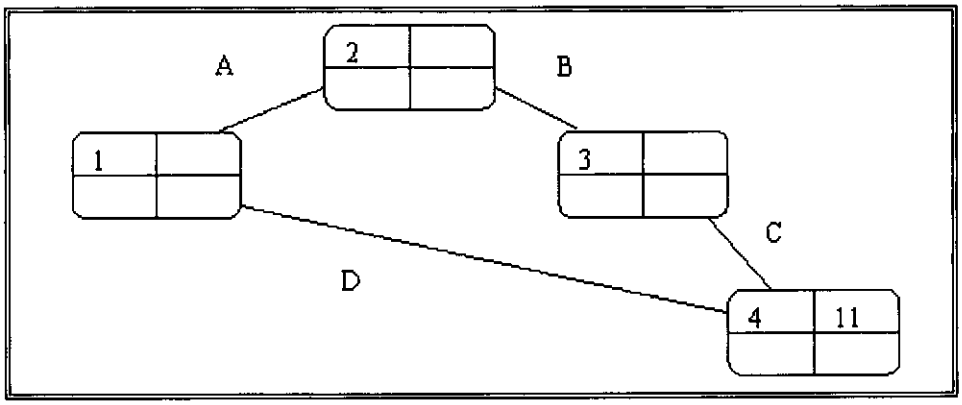


Diagram 5.1: PERT network diagram

Activity	Optimistic (a)	Most Likely (m)	Pessimistic (b)	Expected (t_e)	Standard Deviation (s)
A	3	4	5		
B	1	2	3		
C	2	3	4		
D	4	5	6		

Table: Values for the PERT network

Use the table and the diagram above to calculate the following

5 1 Calculate the expected times (t_e) for all activities (4)

5 2 Calculate the standard deviation (s) for all activities. (4)

5 3 Use Diagram 5 1 to calculate the standard deviation (s) for the fourth (4) task (event) (3)

5 4 Use Diagram 5 1 to determine the Z value for the fourth (4) task (event). (2)

5 5 According to Figure 5.5 below, what is the probability of not meeting the target date? (1)

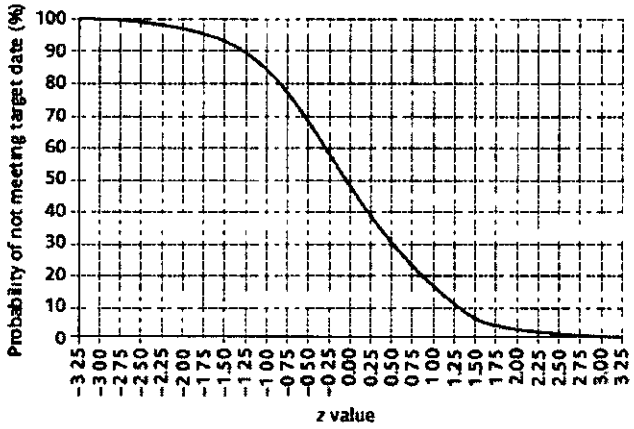


Figure 5.5 for question 5 5

QUESTION 6 [6]

6 1 List and briefly discuss three categories of cost. (3)

6 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}*). (3)

System	Lines of code	System type
A	10568	Embedded mode
B	12572	Semi-detached mode
C	16342	Organic mode

Table for Question 6 2 System details

System type	c	k
Organic	2 4	1 05
Semi-detached	3.0	1 12
Embedded	3.6	1.20

Table for Question 6 2 COCOMO constants

QUESTION 7 [9]

The timeline chart is useful both during the execution of a project and as part of the post-implementation review Sipho is the project leader and his duty is to make sure the project is finished in time The other members and their job specifics are·

Nomsa – Analyse existing systems (2 weeks)
Bennie – Obtain user requirements (3 weeks)
Maggie – Plan office layout (3½ weeks)
Alice – Finalise office layout (4 weeks)
Arthur – Issue tender (4½ weeks)

(Note the weeks in brackets denote the scheduled time within which each person's part of the project is to be completed The longest time, i.e. 4½ weeks is the scheduled time for the completion of the whole project)

After the first week Nomsa is delayed by a week, but she finished by the end of the 3rd week By the end of the 4th week Bennie has finished but Maggie was delayed for a week This was the last delay in the project

7 1 Having collected data about a project, a manager needs some way of presenting that data Name and briefly describe two diagrams that a manager can use to present data (except a timeline chart), for visualizing progress (4)

7.2 Draw a timeline chart to indicate the delayed finishing date of the project (5)

EXAMINERS

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