UNIVERSITY EXAMINATIONS

UNIVERSITEITSEKSAMENS

UNISA university of south africa

INF3708

May/June 2018

Software Project Management

Duration 2 Hours

90 Marks

EXAMINATION PANEL AS APPOINTED BY THE DEPARTMENT

Use of a non-programmable pocket calculator is permissible

Closed book examination

EXAMINATION PANEL

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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 [5]

Write down the question number and the corresponding letter of the correct answer in your examination book. For example 1 – 2

1 Which concept provides practical methods of checking that an objective is met?
   1 Mean time between failures
   2. Measure of effectiveness
   3 Performance audits
   4 Predictive measures

2 _____ Software effort estimation technique is also known as case-base reasoning?
   1 Expert judgement
   2 Price to win
   3 Algorithmic
   4 Analogy

3 Expenditure that an organisation incurs which cannot be directly related to individual projects or jobs, including interest charges is known as
   1 Contingence costs
   2 Usage costs
   3 Staff costs
   4 Overheads costs

4. What needs to be done when identifying project infrastructure?
   1 Identifying project team organisation
   2 Establishing relationship between project and strategic planning
   3 Identifying project stakeholder
   4 All of the above
   5 1 & 2

5 _____ is the difference between the time when the achievement of the current earned value was planned to occur and the time now?
   1 Time variance
   2 Schedule variance
   3 Cost variance
   4. Performance variance

QUESTION 2 [9]

2 1 Highlight at least three characteristics that distinguishes project (3)

2 2 A library in your community is considering the implementation of a computer based system to help them in administering book loan at the library Since they do not have any knowledge of software development, they have approached you to help them understand the benefits and problems of running off-the-shelf software development as one of their options instead of in-house development

Discuss with the library the advantages and disadvantages of running off-the-shelf software development (6)

QUESTION 3 [21]

Table 1 gives the estimated cash flow for three different projects **Project 1, 2 and 3** (in South Africa Rand R)

Year	Project 1	Project 2	Project 3
0	-R200 000	-R150 000	-R125 000
1	+R15 000	+R25 000	+R5 000
2	+R25 000	+R50 000	+R10 000
3	+R30 000	+R75 000	+R55 000
4	+R110 000	+R50 000	+R5 000
5	+R35 000	+R50 000	+R70 000

Table 1: Projects Cash Flow

Based on the information provided in **Table 1** answer questions 3 1 to 3 5 below

3.1 Calculate the net profit for the three projects (3)

3 2 Using the information on Table 1, calculate the ROI for the three projects (3)

3 3 In project management term, how would you explain a payback period? Calculate the payback period for each of the three projects in Table 1 (6)

3 4 If Project 1 and 3 made extra R13,000 and R10,000 respectively for year 3, what would their net profits, ROI and payback period be? (6)

3 5 What changes did you notice with the extra income in question 3 4? Based on your answer in question 3 4 which one of three projects would you consider development and why? (3)

QUESTION 4 [14]

4 1 Given a discount rate of 10% in Table 2 below; calculate the Net Present Value (NPV) for the project you selected for development in question 3 5 Use the cash flow in Table 1 above Please show all your caculations (7)

Year	10% Discount rate
1	0 9091
2	0 8264
3	0 7513
4	0 6830
5	0 6209

Table 2· 10% discount rate

4 2 Base on your calculation of the selected project Net Present Value (NPV), would you still recommend the project for development? Motivate your answer (3)

4 3 The main difficulty with NPV for deciding between projects is selecting an appropriate discounted rate. For some organisation this is easy because they have standard rate Assuming your project will be funded from loan and your organisation do not have standard discounted rate, how would you decide on the discounted rate? Justify your answer (4)

QUESTION 5 [10]

5 1 As a recently graduated software project manager, you are employed in a software development company "Software for you" to work with their project team A new client company ABC was assigned to you to assist them with a completely new project they are embarking on ABC do not have any historical data available on the new project they are about to embark on Before approaching the client company, discuss with your project team which software effort estimation technique you will recommend for ABC and why (6)

5 2 Three systems with the following estimate lines of code were identified Determine how many years it will take to complete system C, using the Boehm's equation for calculating effort in the use of the COCOMO model (4)

System	Line of code	System type
A	10065	Semi-detached mode
B	10762	Semi-detached mode
C	10568	Organic mode

Table 3 System detail

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

Table 4 COCOMO constants

Boehm's equation effort = c* (size)*k

QUESTION 6 [17]

Consider the following activities with their precedents and durations listed in Table 5

Activity	Task definition	Duration	Predecessor
A	Concept	3 day	-
B	Evaluate current systems	2 days	-
C	Define requirements	5 days	-
D	Define specific functionality	3 days	A
E	Develop project plan	6 days	B
F	Brief Web development team	4 days	B
G	Web Site Design	4 days	C
H	Web Site Development	5 days	D and E
I	Roll Out	3 days	G
J	Support	4 days	F, H and I

Table 5· Activity precedents and their durations

6 1 Draw a network diagram Activity-on-Arrow (AOA) Indicate the activity duration, the event number, earliest date, latest date and slack on each node by completing both a forward and backward pass (12)

(N B) 5 marks will be deducted from student for not drawing the current activity diagram

6 2 Clearly indicate the critical path and its total duration (2)

6 3 What is the duration project? (1)

6 4 What is the maximum number of days the briefing of web development team (activity F) can be delayed without affecting the project life span? (2)

QUESTION 7 [14]

In the PERT network illustrated in figure 1 below, the targeted date for the completion of the project is 20 weeks

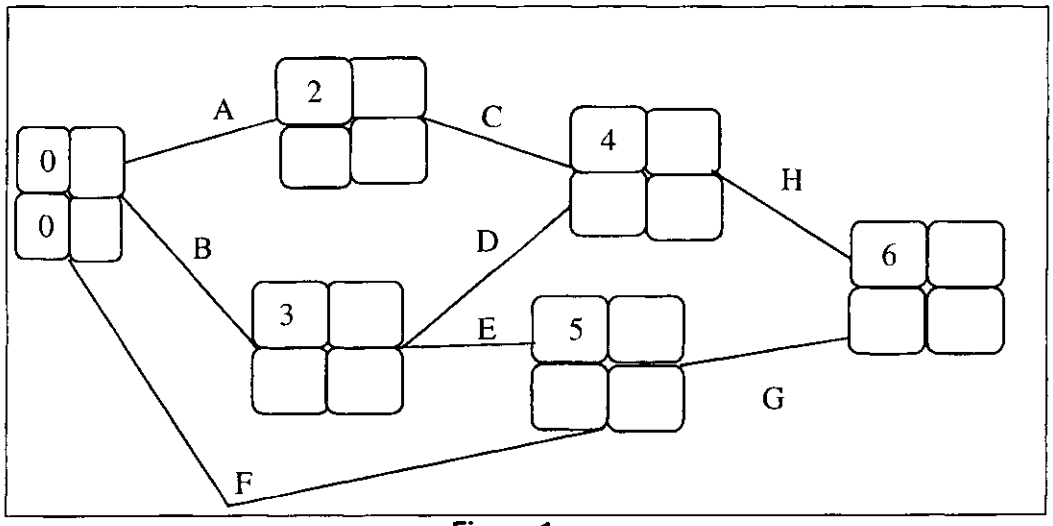

Figure 1

	Optimistic (a)	Most likely (M)	Pessismistic (b)	Expected (t_e)	Standard deviation (s)
A	6	4	8		
B	3	3	5		
C	2	4 5	3		
D	3 5	5	6		
E	1	10	4		
F	8	2	15		
G	1	2 5	1 5		
H	0 5	12	2		

Table 6

Using Table 6 and Figure 1 above answer the following questions:

7 1 Calculate the expected (t_e) values for all the activities in Table 6 (4)

7 2 Calculte standard deviation (s) for all the activities in Table 6 (4)

7 3 Use Figure 1 to calculate the standard deviation (s) for event 4 and 6 (4)

7 4 Calculate the Z value on the last event (2)