UNIVERSITY OF JOHANNESBURG

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PROGRAM : B.ING ENGINEERING

SUBJECT : **PROJECT MANAGEMENT 3B**

CODE : **PJB3B21**

DATE : EXAMINATION
07 November 2014

DURATION : 3 hours

TOTAL MARKS : 120

ASSESSOR : MR D KRUGER
MODERATOR : DR J PRETORIUS
NUMBER OF PAGES : 9 PAGES

INSTRUCTIONS: ***(READ THESE CAREFULLY!):***

1: ANSWER ALL QUESTIONS
2: CLOSED BOOK EXAM. USE OF CALCULATOR IS ALLOWED
3: BOTH YOUR EXAM ANSWER PAPER AND THIS EXAM QUESTION PAPER MUST BE HANDED IN.
4: USE THE SHADED SPACE PROVIDED ON THIS EXAM PAPER FOR ANSWERING THE QUESTIONS. USE EXAM ANSWER BOOK ONLY FOR YOUR OWN ROUGH CALCULATIONS. SUBMIT BOTH EXAM PAPER AND EXAM ANSWER BOOK. ONLY ANSWERS ON THIS EXAM PAPER WILL BE ASSESSED
5: INDICATE YOUR SURNAME/ID NUMBER AND STUDENT REGISTRATION IN THE SPACES PROVIDED ON EACH PAGE OF THIS EXAM PAPER.

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QUESTION 1 **(30)**

Use the data in the following table and calculate the updated ES, EF, LS, LF times and slack for each activity assuming a contractual completion time of 26 weeks and that activities A and B have been finished as indicated. Indicate the activities on the critical path. Can the project still be completed on time? If necessary, identify the activities you would concentrate on to get the project back on schedule.

Activity	Estimated Time (weeks)	Actual Finish Time	Immediate Predecessor
A	3	4	-
B	3	6	-
C	4		A
D	5		A
E	6		B, D
F	7		C,E
G	6		E
H	3		F, G
I	2		H

YOUR ANSWER:

Activity	ES	EF	LS	LF	Slack	Actual Finish
A						
B						
C						
D						
E						
F						
G						
H						
I						

Activities on the critical path:

To get the project back on schedule:

QUESTION 2 **(5)**

List three advantages and two disadvantages of the matrix organization structure?

YOUR ANSWER:

Advantages (3): Disadvantages (2):

QUESTION 3 **(30)**

Indicate whether these statements are True (T) or False (F): (1 mark each)

3.1	Functional organization structures are typically used in businesses that primarily sell and produce standard products.	
3.2	The most common types of organization structures are functional, progressive, and matrix.	
3.3	Progress payments, based on a percentage of the total price, are those made as certain milestones are accomplished.	
3.4	In all cases an RFP should indicate the funds the customer has available to spend on the project	
3.5	The person who is solely responsible for ethical behavior is the project manager.	
3.6	In the early stages of the problem-solving process, the team is often reacting to symptoms rather than dealing with what might be causing the problem.	
3.7	In a functional organization, individuals continue to perform their regular functional jobs while they may serve part-time on a project task force.	

3.8	The hierarchical structure causes communication, problem resolution, and decision making to be slow within a project organization.	
3.9	Although the project manager is ultimately responsible for the success of a project, each member of the project team shares in that responsibility	
3.10	The project organization structure allows for fast response upon problem identification because it has both a horizontal (project) and a vertical (functional) path for the flow of information.	
3.11	In a functional-type organization, the project manager does not have complete authority over the project team	
3.12	The finish estimates (FE) of completed activities will determine the earliest start and earliest finish times for the remaining activities in the network diagram, as well as the total slack.	
3.13	Project selection involves evaluating various needs or opportunities, and then deciding which of these should be moved forward as a project.	
3.14	After actual data or project changes are incorporated or after corrective actions are planned, it is no longer necessary to analyze the newly calculated schedule to determine whether it needs further attention.	
3.15	In the functional-type organization, each project is operated like a mini-company.	
3.16	The problem statement provides a vehicle for reaching agreement among the members of the problem-solving team about the exact nature of the problem they are trying to solve.	
3.17	A network diagram shows the necessary sequence and interdependencies of activities to achieve the project objective.	
3.18	In general, the longer the reporting period, the better the chances of identifying problems early and taking effective corrective actions.	
3.19	A project breakdown list (PBL) is a hierarchical tree of products produced by the project team during the project.	
3.20	Project organization structures are prevalent in aerospace industries.	
3.21	The accommodating or smoothing approach makes a conflict situation livable and leads to resolving the issue.	
3.22	The matrix structure allows efficient utilization of resources by having individuals from various functions assigned to work part-time, if necessary, on specific projects or by having them assigned for only a limited duration to certain projects.	
3.23	Project leadership involves inspiring the people assigned to the project to work as a team to successfully implement the plan and achieve the project objective.	
3.24	The key to effective project control is to measure production quality and compare it to efficiency measures on a timely and regular basis and to take necessary corrective action immediately.	
3.25	Involving the project team in developing the project plan increases cost and time and should be avoided by the project manager.	

3.26	Resource monitoring, is a method for developing a schedule that attempts to minimize the fluctuations in requirements for resources.	
3.27	Activities in a network diagram are drawn in a parallel relationship because, from a technical standpoint, they can be performed in any sequence.	
3.28	The time–quality trade-off methodology is used to incrementally reduce the project duration with the smallest associated increase in incremental cost.	
3.29	To control the project, the project manager implements a project management information system designed to track actual progress and compare it with planned progress.	
3.30	The second phase of the project life cycle is the implementation of the proposed solution.	

QUESTION 4 **(5)**

What does SOW mean? Explain this concept.

YOUR ANSWER:

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QUESTION 5 **(10)**

As per CPM calculations, you determine that the earliest completion date for a project comprising of 8 activities is at the end of week 25. However, the client requires the project to be completed by the end of week 23 and will charge a penalty of R5000 per week if you finish the project later than week 23. What is the probability (rounded off to the nearest percentage) of completing the project within the client's required timeframe. Using CMP analysis, you determine the variance for the total distribution of activities on the longest path on this CPM diagram to be 4.

YOUR ANSWER:

Calculation: (5 marks)	
Probability (5 marks)	

QUESTION 6 **(10)**

A proposal for a project often includes a cost section. List ten (10) cost elements that should be included in this section.

YOUR ANSWER:

Item No	Cost Element
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

QUESTION 7 **(10)**

You determine that a critical activity in your project has a most likely time of 25 days, a pessimistic time of 32 days, and an optimistic time of 23 days. What is the expected duration? What are the variance and standard deviation for this activity if a beta distribution is assumed?

YOUR ANSWER:

Expected Duration of this activity (4)	
Variance (3)	
Standard Deviation (3)	

QUESTION 8 **(20)**

You are the cost controller on Project XT and have the following information available on this project in order to do a cost analysis at the end of week 6.

Table 1 : Budgeted Costs (R 000)

		Week					
	TBC	1	2	3	4	5	6	7
Task 1	30	20	10					
Task 2	50		10	30	10			
Task 3	50			30	20			
Task 4	20				10	10		
Task 5	15					5	5	5
Task 6	30							30

Table 2: Actual Costs (R 000)

	Week						
	1	2	3	4	5	6	7
Task 1	20	5					
Task 2		20	25	5			
Task 3			35	30			
Task 4				20			
Task 5					4	8	
Task 6							

Table 3: Percentage of Work Complete (%)

	Week						
	1	2	3	4	5	6	7
Task 1	80	100					
Task 2	0	40	100				
Task 3	0	0	70	100			
Task 4	0	0	0	90			
Task 5			0	0	0	80	
Task 6						0	

8.1 What is the cumulative budgeted cost at the end of week 6? (2)
8.2 What is the cumulative actual cost at the end of week 6? (2)
8.3 What is the cumulative earned value at the end of week 6? (2)
8.4 What is the Cost Performance Index at the end of week 6? Is this acceptable? (4)
8.5 What is the Cost Variance at the end of week 6? Is this acceptable? (4)
8.6 What is the Forecasted Cost at Completion (FCAC)? Show two different calculations. (6)

YOUR ANSWER:

8.1 (2 marks)		
8.2 (2 marks)		
8.3 (2 marks)		
8.4 (4 marks)		
8.5 (4 marks)		
8.6.1 (1st Method) (3 marks)		
8.6.2 (2nd Method) (3 marks)		

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Table 6.1 Table of Areas of the Normal Curve Between the Maximum Ordinate and Values of *Z*

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	.00000	.00399	.00798	.01197	.01595	.01994	.02392	.02790	.03188	.03586
0.1	.03983	.04380	.04776	.05172	.05567	.05962	.06356	.06749	.07142	.07535
0.2	.07926	.08317	.08706	.09095	.09483	.09871	.10257	.10642	.11026	.11409
0.3	.11791	.12172	.12552	.12930	.13307	.13683	.14058	.14431	.14803	.15173
0.4	.15542	.15910	.16276	.16640	.17003	.17364	.17724	.18082	.18439	.18793
0.5	.19146	.19497	.19847	.20194	.20540	.20884	.21226	.21566	.21904	.22240
0.6	.22575	.22907	.23237	.23565	.23891	.24215	.24537	.24857	.25175	.25490
0.7	.25804	.26115	.26424	.26730	.27035	.27337	.27637	.27935	.28230	.28524
0.8	.28814	.29103	.29389	.29673	.29955	.30234	.30511	.30785	.31057	.31327
0.9	.31594	.31859	.32121	.32381	.32639	.32894	.33147	.33398	.33646	.33891
1.0	.34134	.34375	.34614	.34850	.35083	.35314	.35543	.35769	.35993	.36214
1.1	.36433	.36650	.36864	.37076	.37286	.37493	.37698	.37900	.38100	.38298
1.2	.38493	.38686	.38877	.39065	.39251	.39435	.39617	.39796	.39973	.40147
1.3	.40320	.40490	.40658	.40824	.40988	.41149	.41309	.41466	.41621	.41774
1.4	.41924	.42073	.42220	.42364	.42507	.42647	.42786	.42922	.43056	.43189
1.5	.44319	.43448	.43574	.43699	.43822	.43943	.44062	.44179	.44295	.44408
1.6	.44520	.44630	.44738	.44845	.44950	.45053	.45154	.45254	.45352	.45449
1.7	.45543	.45637	.45728	.45818	.45907	.45994	.46080	.46164	.46246	.46327
1.8	.46407	.46485	.46562	.46638	.46712	.46784	.46856	.46926	.46995	.47062
1.9	.47128	.47193	.47257	.47320	.47381	.47441	.47500	.47558	.47615	.47670
2.0	.47725	.47778	.47831	.47882	.47932	.47982	.48030	.48077	.48124	.48169
2.1	.48214	.48257	.48300	.48341	.48382	.48422	.48461	.48500	.48537	.48574
2.2	.48610	.48645	.48679	.48713	.48745	.48778	.48809	.48840	.48870	.48899
2.3	.48928	.48956	.48983	.49010	.49036	.49061	.49086	.49111	.49134	.49158
2.4	.49180	.49202	.49224	.49245	.49266	.49286	.49305	.49324	.49343	.49361
2.5	.49377	.49396	.49413	.49430	.49446	.49461	.49477	.49492	.49506	.49520
2.6	.49534	.49547	.49560	.49573	.49585	.49598	.49609	.49621	.49632	.49643
2.7	.49653	.49664	.49674	.49683	.49693	.49702	.49711	.49720	.49728	.49736
2.8	.49744	.49752	.49760	.49767	.49774	.49781	.49788	.49795	.49801	.49807
2.9	.49813	.49819	.49825	.49831	.49836	.49841	.49846	.49851	.49856	.49861
3.0	.49865	.49869	.49874	.49878	.49882	.49886	.49889	.49893	.49897	.49900
3.1	.49903	.49906	.49910	.49913	.49916	.49918	.49921	.49924	.49926	.49929
3.2	.49931	.49934	.49936	.49938	.49940	.49942	.49944	.49946	.49948	.49950
3.3	.49952	.49953	.49955	.49957	.49958	.49960	.49961	.49962	.49964	.49965
3.4	.49966	.49968	.49969	.49970	.49971	.49972	.49973	.49974	.49975	.49976
3.5	.49977	.49978	.49978	.49979	.49980	.49981	.49981	.49982	.49983	.49983
3.6	.49984	.49985	.49985	.49986	.49986	.49987	.49987	.49988	.49988	.49989
3.7	.49989	.49990	.49990	.49990	.49991	.49991	.49992	.49992	.49992	.49992
3.8	.49993	.49993	.49993	.49994	.49994	.49994	.49994	.49995	.49995	.49995
3.9	.49995	.49995	.49996	.49996	.49996	.49996	.49996	.49996	.49997	.49997
4.0	.49997	.49997	.49997	.49997	.49997	.49997	.49998	.49998	.49998	.49998