UNIVERSITY OF JOHANNESBURG

FACULTY:	Faculty of Engineering and Built Environment.
DEPARTMENT:	Electrical & Electronic Engineering Technology
CAMPUS:	DFC
MODULE:	PJMELA3 PROJECT MANAGEMENT 3A
SEMESTER:	FIRST

DATE: **4 JUNE** 2019 **TIME:** 8:30H- 11:30H

ASSESSOR(S): Ms. E.N NWOBODO-ANYADIEGWU

MODERATOR: PROF. O. SAMUEL

DURATION: 3 HOURS

MARKS: 100 **WEIGHT**: 50%

NUMBER OF PAGES: 6 PAGES (including Annexure A & B)

INSTRUCTIONS TO CANDIDATES:

- Answer ALL questions.
- This is an open book assessment. Laptops and cellphones are not allowed.
- Question paper must be handed in.
- Leave margins and spaces between the questions.
- Show **all** your calculations.
- Unless otherwise indicated, express your answers correct to **two (2) decimal** places.
- Where appropriate, indicate the units of your answer. (e.g. Hour, R)
- Number your answers clearly.
- Write neatly and legibly
- NOTE: **Marks will be awarded for theoretical knowledge, application of the theory and use of relevant diagrams and examples.**

The general University of Johannesburg policies, procedures and rules pertaining to written assessments apply to this assessment.

SECTIONA **[75]**

QUESTION 1 **[30]**

Provide a brief background for a named single project of your choice; and answer the following questions with reference to your chosen project.

1.1 With the aid of a diagram, discuss the steps you would take in the management of a named project of your choice. Clearly provide activities associated with each item enlisted in the diagram. (20)

1.2 Identify five possible risks that could be associated with the Saint Steven Primary School Renovation Project described in Section B of this paper. (5)

1.3 Name five inputs relevant for project risk identification. (5)

QUESTION 2 **[30]**

Develop the following documents for your chosen project:

2.1 project scope statement (10)

2.2 three level WBS for the project (10)

2.3 stakeholder register (10)

QUESTION 3 **[15]**

3.1 Project managers and functional managers typically have conflicting agendas. Why? justify your answer. (5)

3.2 A project (building a new production line) is extremely important to the survival of a manufacturing company and has to be completed as early as possible. What organizational structure would you recommend given the strategic nature of the project? Motivate your answer (present five reasons why you believe the structure is the most suitable for this project.) (10)

SECTION B **[25]**

<u>Case Study: Saint Steven Primary School Renovation Project</u>

The Alumni of Saint Steven Primary School in Umtata Eastern Cape have undertaken to renovate an old abandoned dilapidated school block in the school premised. The population of the school has doubled in the past six years without any upgrade or expansion of the existing facility. As a result of this capacity constraint, school children were relocated to a nearby church where they are housed temporarily for

classes. The project needs to be completed before the beginning of the rainy season and on time before the next academic intake.

The activity duration (in weeks) and precedence relationship is provided in the tables below.

Activity	Predecessors
A. Water leak detection	-
B. Wall skimming	-
C. Surface preparation	-
D. Drainage system	A
E. Installing new pipes	C
F. Correcting storm water pipes	A
G. Membrane application	C
H. Painting damp	G
I. Installing new tiles	C
J. Fixing door hinges	I
K. Cable trucking	B
L. Wire installing	K
M. Installing switch	L
N. Lamp installation	M
O. Floor skirts	I
P. Paint	B
Q. Cleaning	F,D,P,N,J,O & H

Activity	Optimistic, a	Most Likely, m	Pessimistic, b	Expected time, t=[(a+4m+b)/6]
A	2	3	5	
B	10	12	15	
C	1	2	3	
D	2	3	5	
E	3	5	8	
F	2	4	7	
G	3	5	9	
H	1	2	4	

I	5	8	13
J	1	2	5
K	7	10	13
L	4	5	7
M	3	5	10
N	5	8	14
O	5	7	12
P	30	35	45
Q	3	5	11

1.1 Draw the network diagram for the project (1)

1.2 Calculate the activity duration (t), earliest start (ES), earliest finish (EF), latest start (LS), and latest finish (LF), project completion time, Variance, Slack times by completing the table below. (17)

ACTIVITY	PREDECESSOR	VARIANCE	t	ES	EF	LS	LF	SLACK	CP

1.3 What is the critical path for the network? (1)

1.4 What is the shortest time in which the project can be completed? (2)

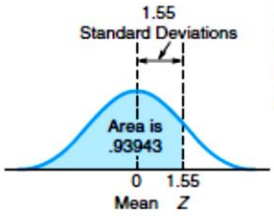
1.5 Why is it necessary for the project manager to know the critical path? (2)

1.6 According to the terms of the contract, the construction company will get a bonus of R100 000 if they are able to finish the project in 56 weeks. What is the probability that they will get the bonus? (2)

TOTAL MARKS **[100]**

END OF ASSESSMENT

Appendix A: Areas Under the Standard Normal Curve



Example: To find the area under the normal curve, you must know how many standard deviations that point is to the right of the mean. Then the area under the normal curve can be read directly from the normal table. For example, the total area under the normal curve for a point that is 1.55 standard deviations to the right of the mean is .93943.

	00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.50000	.50399	.50798	.51197	.51595	.51994	.52392	.52790	.53188	.53586
0.1	.53983	.54380	.54776	.55172	.55567	.55962	.56356	.56749	.57142	.57535
0.2	.57926	.58317	.58706	.59095	.59483	.59871	.60257	.60642	.61026	.61409
0.3	.61791	.62172	.62552	.62930	.63307	.63683	.64058	.64431	.64803	.65173
0.4	.65542	.65910	.66276	.66640	.67003	.67364	.67724	.68082	.68439	.68793
0.5	.69146	.69497	.69847	.70194	.70540	.70884	.71226	.71566	.71904	.72240
0.6	.72575	.72907	.73237	.73536	.73891	.74215	.74537	.74857	.75175	.75490
0.7	.75804	.76115	.76424	.76730	.77035	.77337	.77637	.77935	.78230	.78524
0.8	.78814	.79103	.79389	.79673	.79955	.80234	.80511	.80785	.81057	.81327
0.9	.81594	.81859	.82121	.82381	.82639	.82894	.83147	.83398	.83646	.83891
1.0	.84134	.84375	.84614	.84849	.85083	.85314	.85543	.85769	.85993	.86214
1.1	.86433	.86650	.86864	.87076	.87286	.87493	.87698	.87900	.88100	.88298
1.2	.88493	.88686	.88877	.89065	.89251	.89435	.89617	.89796	.89973	.90147
1.3	.90320	.90490	.90658	.90824	.90988	.91149	.91309	.91466	.91621	.91774
1.4	.91924	.92073	.92220	.92364	.92507	.92647	.92785	.92922	.93056	.93189
1.5	.93319	.93448	.93574	.93699	.93822	.93943	.94062	.94179	.94295	.94408
1.6	.94520	.94630	.94738	.94845	.94950	.95053	.95154	.95254	.95352	.95449
1.7	.95543	.95637	.95728	.95818	.95907	.95994	.96080	.96164	.96246	.96327
1.8	.96407	.96485	.96562	.96638	.96712	.96784	.96856	.96926	.96995	.97062
1.9	.97128	.97193	.97257	.97320	.97381	.97441	.97500	.97558	.97615	.97670
2.0	.97725	.97784	.97831	.97882	.97932	.97982	.98030	.98077	.98124	.98169
2.1	.98214	.98257	.98300	.98341	.98382	.98422	.98461	.98500	.98537	.98574
2.2	.98610	.98645	.98679	.98713	.98745	.98778	.98809	.98840	.98870	.98899
2.3	.98928	.98956	.98983	.99010	.99036	.99061	.99086	.99111	.99134	.99158
2.4	.99180	.99202	.99224	.99245	.99266	.99286	.99305	.99324	.99343	.99361
2.5	.99379	.99396	.99413	.99430	.99446	.99461	.99477	.99492	.99506	.99520
2.6	.99534	.99547	.99560	.99573	.99585	.99598	.99609	.99621	.99632	.99643
2.7	.99653	.99664	.99674	.99683	.99693	.99702	.99711	.99720	.99728	.99736
2.8	.99744	.99752	.99760	.99767	.99774	.99781	.99788	.99795	.99801	.99807
2.9	.99813	.99819	.99825	.99831	.99836	.99841	.99846	.99851	.99856	.99861
3.0	.99865	.99869	.99874	.99878	.99882	.99886	.99889	.99893	.99896	.99900
3.1	.99903	.99906	.99910	.99913	.99916	.99918	.99921	.99924	.99926	.99929
3.2	.99931	.99934	.99936	.99938	.99940	.99942	.99944	.99946	.99948	.99950

Annexure B: Formula Sheet

$$t = \frac{a + 4m + b}{6}$$

Expected activity completion time for activity.

$$\text{Variance} = \left(\frac{b - a}{6}\right)^2$$

Activity variance.

$$EF = ES + t$$

Earliest finish time.

$$LS = LF - t$$

Latest start time.

$$\text{Slack} = LS - ES \quad \textit{or} \quad \text{Slack} = LF - EF$$

Slack time in an activity.

(12-6) Project variance = Σ variances of activities on critical path

$$(12\text{-}7)\ Z = \frac{\text{Due date} - \text{Expected date of completion}}{\sigma_T}$$

Number of standard deviations the target date lies from the expected date, using the normal distribution.

(12-8) Value of work completed = (Percentage of work completed) × (Total activity budget)

(12-9) Activity difference = Actual cost − Value of work completed

$$(12\text{-}10)\ \text{Crash cost/Time period} = \frac{\text{Crash cost} - \text{Normal cost}}{\text{Normal time} - \text{Crash time}}$$

The cost in CPM of reducing an activity's length per time period.