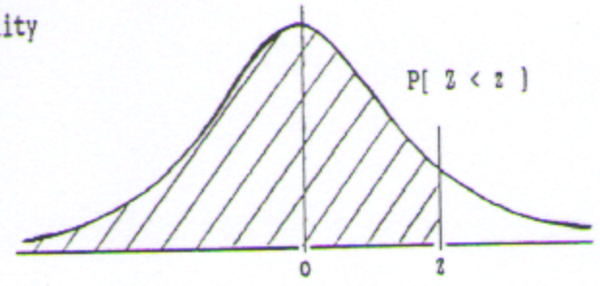
STANDARD STATISTICAL TABLES

1. Areas under the Normal Distribution

The table gives the cumulative probability up to the standardised normal value z

i.e.

$$P[\, Z < z \,] = \int_{-\infty}^{z} \frac{1}{\sqrt{2\pi}} \exp(-\tfrac{1}{2}Z^2)\, dZ$$



z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5159	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7854
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8804	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9773	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9865	0.9868	0.9871	0.9874	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9924	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9980	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986

z	3.00	3.10	3.20	3.30	3.40	3.50	3.60	3.70	3.80	3.90
P	0.9986	0.9990	0.9993	0.9995	0.9997	0.9998	0.9998	0.9999	0.9999	1.0000

AFRICA UNIVERSITY
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MMS503 - PROJECT ANALYSIS AND MANAGEMENT (EMBA HARARE/CHIMOIO)

FINAL EXAMINATION

MARCH 2017

LECTURER: DR S. MURAIRWA

TIME: 3 HOURS

INSTRUCTIONS

Answer **All** questions.

Start **each** question on a new page in your answer booklet.

The marks allocated to **each** question are shown at the end of the question.

Show all your workings.

Credit will be given for logical, systematic and neat presentations.

1. The role of line mangers

Background:
The project management methodology was finally beginning to take shape. However, even though the basic structure of the methodology was in place, there were still gaps that had to be filled in. one of these gaps was a well-defined role for the line managers.

The meeting:
VP: "From what I've read about project management, it is very difficult at first to get line managers to effectively support projects. I want our liner managers to effectively support projects. I want our line managers to become fully committed to project management as quickly as possible."
PM: "I agree with you! It's not good for a line manager to assign people to a project and then take no interest in the project at all."
VP: "I believe the line managers have the power to make or break a project. Simply stated, we need them to share in the accountability after they assign resources."
PM: "I'm not exactly sure how to do that. There is no way that I as project manager can force a line manager to share accountability with me for the project's success or failure."
VP: "I know this will be difficult at first but I believe it can be done. The methodology should define the expectations that the executives have on the role of the line managers in each life cycle phase as well as the working relationships in each phase. See if you can get some of our line managers to help you in this regard."
PM: "On most of our projects, the technical direction to the employees is still provided by the line managers, even after the employee is assigned. Most of our project managers have an understanding of technology, not a command of technology. However, we do have some projects where the technical know-how resides with the project manager, who must then provide daily technical supervision. How do I cover both bases in the design of the methodology?"
VP: "It seems to me that in one situation the project manager would be negotiating with the line manager for deliverables and in the second situation the negotiation would be for specific people. I'm sure you'll find a way to incorporate this into the methodology."

Attempt the following questions:

a) Should a methodology also include staffing policies? If so, what would be an example of a staffing policy? **[2 marks]**
b) When should a project manager negotiate for people and when should the project manager negotiate for deliverables? **[2 marks]**
c) Should a staffing policy also distinguish between full-time and part-time assignments? **[2 marks]**
d) Explain how the misunderstanding between the line manager and project manager could be handled by the organisation **[10 marks]**
e) State and explain the skills required by a project manager **[6 marks]**

2. With a diagram, explain the project life cycle and its importance **[8 marks]**

3. Building a new bridge
   a) Explain how Deming's quality philosophy can be used to manage the project **[8 marks]**
   b) Show how assessments of risks fit into the tactical planning of a project **[6 marks]**
   c) Cost Benefit Analysis (CBA) is not a perfect tool of project appraisal. Give four reasons why you support this assertion **[4 marks]**
   d) Explain how you would align the project to the vision and strategy of your construction company **[9 marks]**

4. A five year project with an initial investment of $50 000 in first year and $10 000 in the second, third and fourth years and $40 000 in fifth year. Estimated benefits in year one is $0 and $30 000 in each of the second, third and fourth years. The fifth year has $50 000. Use 5% discount rate to analyse the project and explain your results **[6 marks]**

5. The project team used a template given below to define the schedule and budget trends of the project.

Measure	Ahead	Behind	Over-budget	Target (Budget & Schedule)	Under-budget
Cost Variance					
Schedule Variance					
Cost Performance Index					
Schedule Performance Index					

   Copy and complete the template **[10 marks]**

6. A project has activities with the following normal and crash times and cost:

Activity	Predecessor	Time (weeks)		Cost ($)	
		Normal	Crash	Normal	Crash
A	-	4	3	8000	9000
B	A	5	3	16000	20000
C	A	4	3	12000	13000
D	B	6	5	34000	35000
E	C	6	4	42000	44000
F	D	5	4	16000	16500
G	E	7	4	66000	72000
H	G	4	3	2000	5000

   (a) If the project deliverable is a new staff member, state the description of each activity **[4 marks]**
   (b) The management of a company is interested in crashing of the project by spending an additional amount not exceeding $2 000. Suggest how this can be accomplished **[15 marks]**
   (c) Develop a linear programming model for crashing the project with the maximum **[8 marks]**

End of paper

ADDITIONAL INFORMATION

1. $K = \frac{C_c - C_n}{M}$

2. $M = T_n - T_c$

3. Let:
   o = optimistic time estimate
   m = most likely time estimate
   p = pessimistic time estimate

   $Mean\ (Expected\ Time): t = \frac{o+4m+p}{6}$

   $Variance: \sigma^2 = \left(\frac{p-o}{6}\right)^2$

4. Social cost = Private costs + Negative Externalities

5. Social benefit = Private benefits + Positive externalities

6. $Z = \frac{x-\mu}{\sigma}$