AFRICA UNIVERSITY

(A United Methodist-Related Institution)

COURSE TITLE: MMS503 Project Analysis and Management

SEMESTER 1: Final Examination - MBA

DATE: November 2013

LECTURER: Dr. S. Murairwa

TIME: 3 Hours

INSTRUCTIONS

Answer **all questions** in Section A and **any three (3)** in Section B

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

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

Show all your workings.

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

SECTION A: ANSWER ALL QUESTIONS

1. Although senior management seemed somewhat pleased with the new methodology, there was some concern that the role of senior management was ill-defined. The vice president felt that this needed to be addressed quickly so that other executives would understand that they have a vital role in the project management process.

   The conversation between the Vice President (VP) and Project Manager (PM):

   VP: "Many of our executives are not knowledgeable in project management and need some guidance on how to function as a project sponsor. Without this role clarification, some sponsors might be "invisible" while others may tend to be too actively involved. We need a balance."

   PM: "I understand your concerns and agree that some role description is needed. However, I don't see how the role description will prevent someone from becoming invisible or overbearing."

   VP: "That's true but we still need a starting point. We may need to teach them how to function as a sponsor."

   PM: "If the sponsor can change based upon which life cycle phase we are in, then, we should delineate the role of the sponsor per phase."

   VP: "That is a good point. Let's also make sure we define the role of the sponsor at the gate review meetings."

   Attempt the following questions:
   (a) What should be the primary role for the sponsor?   **[1 Mark]**
   (b) Will the role change based upon the life cycle?   **[1 Mark]**
   (c) Is it advisable for the sponsor to change based upon the life cycle phase? **[3 Marks]**
   (d) List the project life cycle phases   **[4 Marks]**
   (e) Will the role delineation in the methodology force the sponsor to perform as expected?
   [2 Marks]
   (f) What should be the sponsor's role during gate review meetings?   **[2 Marks]**

2. The activities in the table below describe the construction of a new house:

	Activity	Preceding	Time in days		
			a	m	b
A	Clear site	-	3	5	6
B	Excavate	-	2	4	6
C	Pour foundation	A,B	5	6	7
D	Frame house	A,B	7	9	10
E	Lay floor	B	2	4	6
F	Lay roof	C	1	2	3
G	Plumbing	D	5	8	10
H	Finish interior	D,F	6	8	10
I	Finish exterior	E,G,H	3	4	5

(a) Calculate the slack of each activity **[9 Marks]**
(b) Briefly discuss the slack results you obtained in (a) **[5 Marks]**
(c) What is the probability that plumbing will be completed on time? **[3 Marks]**
(d) Assuming the project completion time follows a Gaussian distribution, what is the probability that the project can be completed in 25 days or less? **[6 Marks]**
(e) What are the differences between the CPM and PERT? **[4 Marks]**

SECTION B: ANSWER ANY THREE (3) QUESTIONS

3. Briefly discuss the following types of project management contracts:
   (a) Fixed price **[7 Marks]**
   (b) Cost reimbursable **[7 Marks]**
   (c) Time and materials **[6 Marks]**

4. Attempt the following questions:
   a) State and briefly explain the skills required by the project manager **[3 Marks]**
   b) Define extrinsic and intrinsic motivations **[2 Marks]**
   c) Outline and criticise the following theories:
      i) Maslow's Hierarchy of needs **[5 Marks]**
      ii) Herzberg's Motivation **[5 Marks]**
      iii) Deming **[5 Marks]**

5. Consider a five year project with an initial investment of $100 000 in the first year and $20 000 in the 2nd, 3rd and 4th year and 80 000 in the 5 year. The estimated benefits in year one is $0 and $60 000 in each of the 2nd, 3rd and 4th years. The fifth year has $100 000. Use a discount rate of 0.10 to analyse the project. Clearly display the net present value, return on investment and year in which paybacks occurs. Write a paragraph on whether you would recommend investing in this project basing on your financial analysis results. What are the advantages of using the net present value? **[20 Marks]**

6. Dr. Murairwa is planning to build a boarding primary school.
   (a) Use the first two project planning tools to plan the project. State the weaknesses of the first project planning tool **[10 Marks]**

   (b) State four assumptions you need to analyse the project **[4 Marks]**
   (c) Identify the attributes of the project **[6 Marks]**

The end of paper

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. Some headings of the financial Analysis template: net cash flow, present value of benefits, flow of costs and discount factor.

5. Social cost = Private costs + Negative Externalities

6. Social benefit = Private benefits + Positive externalities

7. Planned Value = Total Cost of Project x % of Planned Work = Budget at Completion x % of Planned Work.

8. Standard Normal Distribution: $z = \dfrac{x - \mu}{\sigma}$

9. Control Charts

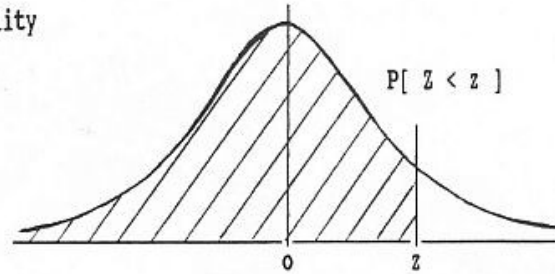 | X bar Charts | R Chart | C Chart |
    |---|---|---|
    | $UCL = \acute{X} + z\,\sigma_{\acute{X}}$ | $UCL = \acute{X} + A_2 \acute{R}$ $UCL = D_4 \acute{R}$ | $UCL = c + z\sqrt{c}$ |
    | $LCL = \acute{X} - z\,\sigma_{\acute{X}}$ | $LCL = \acute{X} - A_2 \acute{R}$ $LCL = D_3 \acute{R}$ | $LCL = c - z\sqrt{c}$ |

STANDARD STATISTICAL TABLES

1. Areas under the Normal Distribution

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

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

P[Z < z]

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