

STRATHMORE BUSINESS SCHOOL
MASTER OF SCIENCE IN DEVELOPMENT FINANCE
SPECIAL EXAMINATION
MDF 8109: PROJECT FINANCE AND MANAGEMENT

Wenesday, 26th March 2025

Time: 3Hours

Instructions

1. This examination consists of FIVE questions.
2. Answer Question ONE and ANY OTHER TWO questions.
3. You are expected to work independently

Problem 1 [compulsory] (25 Marks)

Green Willows Company is a large financial investment company in Kenya. It uses the payback period in its project investment policy, and requires all investments to have a payback period (after taxes) within 6 years. An investment of \$100,000 is to be spent on upgrade to the IT system in the company. Of the \$100,000 total investment, \$65,000 corresponds to IT equipment only depreciable by the straight line method, with a salvage value of \$5,000 after 6 years. The remaining \$35,000 is depreciable by the double declining balance method. After the modifications, the benefits (Revenue) per year will amount to \$32,000 each year for the next six years. The tax rate for the company is 48%.

- a) Using a table format, calculate the total depreciation for each year (Y1 – Y6) i.e. depreciation for the \$65,000 investment + depreciation for the \$35,000 investment. (6 marks)
- b) On a separate table, generate the operating cash inflows for each year (Y1 – Y6) for the new investment. (10 marks)
- c) If this investment company has an incremental tax rate of 48%, what is the after tax payback period (rounded to 1 decimal point) for this investment? (5 marks).

d) Should the proposed investment be accepted by the Company? Explain. (4 marks)

Note: The formula for the double declining balance is given as;

$$m \times (1/n) \times \text{NBV}$$

Whereby ‘m’ is the multiple, ‘n’ is the depreciable life of the asset, and NBV is the asset’s net book value at the start of the year.

Problem 2 (25 Marks)

- a) A project can be defined by its unique characteristics that distinguish it from routine day to day work. Briefly explain any two project characteristics **(4Marks)**
- b) Briefly explain why it is important for the Project Manager to possess knowledge and skills on how to “crash project activities”. **(4 Marks)**
- c) Consider the following information regarding a project concerning an initial public offering (IPO).

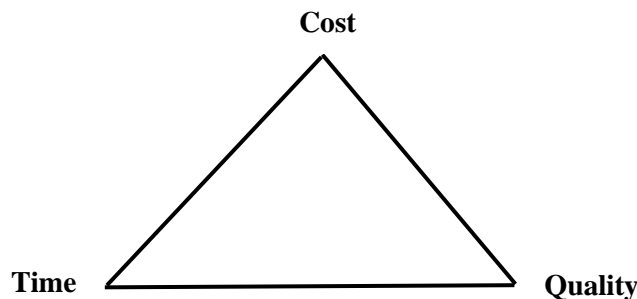
Activity	t_e (weeks)	Preceding activities
a	3	None
b	1	None
c	3	a
d	4	a
e	4	b
f	5	b
g	2	c, e
h	3	f

- i) Draw the AON / CPM network **(3 Marks)**
- ii) When will the IPO offering be available (completion of the project)? **(3 Marks)**
- iii) What will be the effect on the project if activity “e” (approvals) takes 2 extra weeks? **(3Marks)**

- iv) If the offering for the IPO has to be available 1 week earlier than the time as indicated in (ii) above, and given that activities **d**, **g**, **e** and **h** can all be crashed by 1 week at the same cost for each activity (which is lowest cost for all the activities), which activity would you choose to crash by 1 week so as to avail the IPO offer one week earlier than anticipated and why? (3Marks)
- v) What managerial precautions should be taken into account while crashing a project? (5 Marks)

Problem 3 (25 Marks)

- a) The project environment is stressful, and Project Managers often come under immense pressure to manage the project “Time” and “Cost” elements to the detriment of the overall project quality. Figure 1 depicts the so called “triple constraint” that is ever present in the project environment. Explain what you understand by the term “triple constraint” in a project environment. (4 marks)



- b) You have been assigned as the Project Manager tasked with planting trees on the plot of land behind the company’s new coffee factory. The plan is as follows: -

30 batches of 20 trees (600 trees) to be planted, 5 batches per day (100 trees). The budgeted cost per tree is Kshs. 290 (Kshs. 250 per baby tree plus Kshs. 40 for the slow release fertilizer). The total budget provided is Kshs. 174,000. After the first day only 70 trees have been planted (the team hit a patch with stones that had to be removed before the trees could be planted). The total cost spent was Kshs 35,000 for the first day (the team had to rent a special machine to help remove the stones which cost Kshs 14,700 for the day). You are required to report to the steering committee on performance and determine how much time and cost remain. Required: Using the various Earned Value Management (EVM) formulas, determine the following for inclusion into the Project report;

- i) Cost Variance at the end of day one (amount in Ksh.) **(3 Marks)**
- ii) Schedule Variance (amount in Ksh.) **(3 Marks)**
- iii) Estimated cost at project completion (Ksh.) **(3 Marks)**
- c) During a negotiation process with a contractor outsourced by your organization to carry out a major project, you suspect that the contractor is involved in “*front loading*”.

Briefly explain what you understand by the term “*front loading*” as applied here and in reference to the contractor, and how you would go about correcting this anomaly with the contractor during the negotiation process. **(4 Marks)**

- d) What would be the risk to your project if you were to allow the contractor to get away with the front loading as described in “c” above? **(4 Marks)**
- e) Explain what Multitasking is in Project Management, and why it may lead to project delays **(4 Marks)**

Problem 4 (25 Marks)

- a) List and explain in each case, three benefits an organization /firm can derive from using contractors to undertake some work for it, rather than using its own employees? **(6 marks)**
- b) In a project that you are undertaking, it has become necessary to issue a variation notice to the contractor in the course of execution of the agreed works. Explain 2 precautions you would undertake to ensure the variation instructions you issue are well understood by the contractor? **(4marks)**
- c) Explain and elaborate 5 ways you may employ to try and shorten project duration **(5Marks)**

Facing the dearth of infrastructure funding, an increasing number of countries in Africa are turning to Public-Private Partnerships (PPPs) in order to tap private capital. Although PPPs cannot fully solve this problem, they can provide significant financing where viable projects are carved out. Yet PPPs in Sub-Saharan Africa remain a very small market, with projects concentrated in only a few countries namely, South Africa, Nigeria, Kenya, and Uganda.

- d) List and explain 3 critical factors needed for the success of PPPs. **(6 marks)**
- e) Indicate 4 benefits of PPPs in Kenya, elaborating in each case why this is a significant benefit attributable to the PPP form of procurement. **(4 marks)**

Problem 5 (25 Marks)

An earth dam project is to be constructed in Kenya to alleviate the problem of drought / water scarcity during the dry season. It has the following activities.

ACTIVITY			ESTIMATED DURATION (Months)		
START NODE	FINISH NODE		OPTIMISTIC	MOST LIKELY	PESSIMISTIC
1	2	A	1	1	7
1	4	B	2	2	8
1	3	C	1	4	7
2	5	D	2	5	14
3	5	E	2	5	8
4	6	F	3	6	15
5	6	G	1	1	7

- Draw an AOA (activity on arrow) project network and identify / mark all paths through it. **(4 Marks)**
- Find the expected duration and variance for each activity. **(4 Marks)**
- What is the expected project length and its variance? **(4 Marks)**
- What is the probability that the project will be completed in less than 12 months? **(3Marks)**
- What is the probability that the project will be completed in less than 10 months? **(3Marks)**
- What is the probability that the project will be completed in more than 12 months? **(3Marks)**
- Why is the chance of finishing the project as per the expected project length in c) above (expected project length) not 100%? Explain. **(4 Marks)**

Note: Probabilities for the standard normal distribution are given as Appendix 1 on the last page.

Appendix 1: Probabilities for the Standard Normal Distribution

Cumulative Probabilities for the Standard Normal Distribution										
FIRST DIGIT OF z	SECOND DIGIT 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	0.5000	0.5040	0.5080	0.5120	0.5160	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	0.7852
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	0.8810	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	0.9772	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	0.9864	0.9868	0.9871	0.9875	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	0.9925	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	0.9979	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
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990