



UNIVERSITY OF RUHUNA
FACULTY OF MANAGEMENT AND FINANCE

No. of Pages : 04
No. of Questions: 03
Total Marks : 70

BACHELOR OF BUSINESS ADMINISTRATION HONOURS DEGREE

3000 LEVEL - FIRST SEMESTER END EXAMINATION - AUG/SEP 2023

Three Hours

MGT 31603: Project Management

Academic Year: 2023

Instructions

➔ Answer all questions.

Question 01

- Discuss the main characteristics of projects.
- Explain the work breakdown structure with an example.
- Briefly explain the different aspects a project manager should consider when conducting a feasibility analysis.
- Why are cost and time estimations such an important part of project planning?
- Explain how project Milestone Analysis and Tracking Gantt Chart could be used in project monitoring and controlling.

(05 marks each: Total 25 marks)

Question 02

- Consider the following project tasks and their identified predecessors and respond to the questions:

Activity	Expected Duration (Weeks)	Predecessors
A	5	—
B	6	A
C	2	A
D	2	A
E	8	B, C
F	6	D, E
G	10	F
H	3	G
I	18	F
J	7	H, I

- Draw the network diagram. (05 Marks)
- What is the critical path? Which activities have slack time? (05 Marks)

b. You are considering whether or not to crash a project. After asking your operations manager to conduct an analysis, you have determined the "precrash" and "post-crash" activity durations and costs, shown in the table below.

Activity	Normal Duration (Weeks)	Normal Cost (Rs. in Millions)	Crash Duration (Weeks)	Crash Cost (Rs. in Millions)
A	5	10	4	15
B	6	24	6	24
C	2	20	1	21
D	2	60	1	62
E	8	24	4	48
F	6	54	3	99
G	10	84	8	86
H	3	48	2	60
I	18	180	17	250
J	7	77	6	127

- i. Calculate the per-day costs for crashing each activity. (05 Marks)
- ii. Which are the most attractive activities for crashing? Why? (05 Marks)
- iii. Using a diagram, show the relationship between cost and weeks saved in a crashed project. (05 Marks)

(Total 25 marks)

Question 03

a. Consider a capital investment whose net present value (NPV) has the following distribution:

NPV (Rs. Millions)	Probability
400	0.1
450	0.25
500	0.3
550	0.25
600	0.1

Determine and explain the statistical risk measures listed below:

- i. Range
- ii. Standard Deviation
- iii. Semi-variance.

(05 Marks)

- b. Assume you are the financial director of Meliya Rice Mills. Ginisena, the owner of Meliya Rice Mills, is considering establishing a new mill near Tissamaharama. Ginisena's project team developed the figures shown in the table below based on previous experience.

	(Rs. in Millions)	
	Year 0	Year 1-20
1. Investment	(2000)	
2. Sales		3600
3. Variable Cost (60% of sales)		2160
4. Fixed Cost		440
5. Depreciation		100

You are aware, however, that the underlying variables can vary widely, and you want to investigate the effect of such variations on the NPV, so you define optimistic and pessimistic estimates for the underlying variables, and the values are shown in the table below.

Key Variable	Pessimistic	Expected	Optimistic
Investment (Rs. in Millions)	10000	2000	1500
Sales (Rs. in Millions)	2500	3600	5000
Variable cost as a percentage of sales	90	60	50
Fixed Cost (Rs. in Millions)	600	440	400

Answer the following questions using the information provided above and assuming a 10% cost of capital.

- Conduct a sensitivity analysis and explain how the results help project managers make informed decisions. (05 Mark)
- Perform a scenario analysis based on the same three identified scenarios and explain the results to determine the project's risk. (05 marks)
- Calculate the financial break-even point **under the expected condition** for the new mill and describe how these figures can be used for decision-making. (05 Marks)

(Total 20 marks)

CUMULATIVE PRESENT VALUE TABLE

Cumulative present value of \$1 per annum, Receivable or Payable at the end of each year for n years $\frac{1-(1+r)^{-n}}{r}$

Periods (n)	Interest rates (r)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606
16	14.718	13.578	12.581	11.652	10.838	10.106	9.447	8.851	8.313	7.824
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022
18	16.398	14.992	13.754	12.659	11.690	10.826	10.059	9.372	8.756	8.201
19	17.226	15.679	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365
20	18.046	16.351	14.878	13.590	12.462	11.470	10.594	9.818	9.129	8.514

Periods (n)	Interest rates (r)									
	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.708	3.605
8	5.148	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675
16	7.379	6.974	6.604	6.265	5.954	5.668	5.405	5.162	4.938	4.730
17	7.549	7.120	6.729	6.373	6.047	5.749	5.475	5.222	4.990	4.775
18	7.702	7.250	6.840	6.467	6.128	5.816	5.534	5.273	5.033	4.812
19	7.839	7.366	6.938	6.550	6.198	5.877	5.584	5.316	5.070	4.843
20	7.963	7.469	7.025	6.623	6.259	5.929	5.626	5.353	5.101	4.870

Some Important Formulas

$$\text{Standard deviation } \sigma = \left[\sum P_i (X_i - \bar{X})^2 \right]^{1/2}$$

$$\text{Variance} = \left[\sum P_i (X_i - \bar{X})^2 \right]$$

$$\text{Coefficient of variation } CV = \frac{\text{Standard deviation}}{\text{Expected Value}}$$