

Semester: Jan-Mar 2024		
Maximum Marks: 50 Examination: ESE Exam Date: 26-03-24 Duration: 3 Hours		
Programme code: 01 Programme: MBA (Ops) Major	Class: SY	Semester/Trimester: VI
College: K. J. Somaiya Institute of Management	Name of the department/Section/Center: Operations and Supply Change Management	
Course Code: 217P01C612	Name of the Course: Project Management (Major)	
Instructions: Question 1 is compulsory. Answer any two from Q2 to Q4 and any two from Q5 to Q7		

Question No.		Max. Marks																												
1	<p>Under Malabar Hill, there is a century old reservoir which supplies water to entire south Mumbai. BMC wants to rebuild that reservoir as structural stability of that reservoir is questionable as per BMC. During re-building of that reservoir famous "Hanging Gardens" which sits on top of this reservoir will be off-limits for several years. Also, water needs to be supplied for entire South Mumbai through alternate means. There is a strong opposition to this project by residents as they will not be able to visit "Hanging Gardens". Environmentalists and nature lovers are up in arms as hundreds of trees will be cut. Section of the population feels that there is no need to rebuild the reservoir as it is in good shape and minor repairs can do the job. Malabar Hill is home to richest population in Mumbai with many top Industrialists, Corporate executives and ministers living in this area.</p> <p>BMC has hired you as Project Management Consultant for this project and asked you to prepare a Project Charter Document for submission for public hearing.</p> <p>Please prepare Project charter with following paragraphs</p> <ul style="list-style-type: none"> • Project Purpose or Justification • High-level Project description and boundaries • High-level Requirements • Assumptions and constraints • High-level risks • Summary milestone Schedule • Summary Budget • Stakeholder list 	10																												
2	<p>Activity and Precedence list along with "Expected Time" for completion and variance is given in below table</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Activity</th> <th style="text-align: center;">Predecessor</th> <th style="text-align: center;">Expected Time</th> <th style="text-align: center;">Variance</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">A</td> <td style="text-align: center;">-</td> <td style="text-align: center;">2</td> <td style="text-align: center;">2/6</td> </tr> <tr> <td style="text-align: center;">B</td> <td style="text-align: center;">-</td> <td style="text-align: center;">3</td> <td style="text-align: center;">2/6</td> </tr> <tr> <td style="text-align: center;">C</td> <td style="text-align: center;">A</td> <td style="text-align: center;">2</td> <td style="text-align: center;">4/6</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">B</td> <td style="text-align: center;">4</td> <td style="text-align: center;">4/6</td> </tr> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">C</td> <td style="text-align: center;">4</td> <td style="text-align: center;">2/6</td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">C</td> <td style="text-align: center;">3</td> <td style="text-align: center;">1/6</td> </tr> </tbody> </table>	Activity	Predecessor	Expected Time	Variance	A	-	2	2/6	B	-	3	2/6	C	A	2	4/6	D	B	4	4/6	E	C	4	2/6	F	C	3	1/6	10
Activity	Predecessor	Expected Time	Variance																											
A	-	2	2/6																											
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E	C	4	2/6																											
F	C	3	1/6																											

	G	D, E	5	1/6		
	<ol style="list-style-type: none"> 1. Draw project network diagram 2. Calculate Project Duration 3. Identify critical path 4. What is project variance and standard deviation? 5. What is the probability that project will be completed in 15 weeks? 6. Z value table is given in annexure I 					
3	Activity and Precedence list along with Normal Time, Crash Time, Normal Cost and Crash Cost are as given below					
	Activity	Predecessor	Normal Time (Months)	Crash Time (Months)	Normal Cost \$	Crash Cost \$
	A	-	10	8	2000	2400
	B	-	7	5	3000	3500
	C	A	9	8	1000	1300
	D	B	6	4	2000	2600
	E	D	9	8	8800	9000
	<ol style="list-style-type: none"> 1. Please draw project network diagram 2. Calculate project duration 3. Identify critical path 4. Determine the least cost to crash project by 3 months 5. Can we crash the project beyond 3 months? If yes, how much and at what cost? 6. What is the best possible crash schedule and cost for it? 					
4	Write short notes on any two					
	<ol style="list-style-type: none"> 1. What is Project, Program and Portfolio. Please explain with examples 2. What is RACI Matrix. Please draw RACI Matrix for Placement process 					
					10	

5

A project with duration of 20 weeks was reviewed at the end of 10 weeks with status as follows

Week	Cumulative Planned Completion	Cumulative Actual Completion	Weekly Planned cost Budget	Weekly Actual cost incurred
1	5%	4%	100	120
2	10%	7%	100	150
3	15%	12%	100	100
4	20%	15%	100	110
5	25%	20%	100	130
6	30%	23%	100	140
7	35%	25%	100	100
8	40%	25%	100	170
9	45%	30%	100	80
10	50%	35%	100	90
11	55%		100	
12	60%		100	
13	65%		100	
14	70%		100	
15	75%		100	
16	80%		100	
17	85%		100	
18	90%		100	
19	95%		100	
20	100%		100	

Calculate

1. Schedule Variance
2. Cost variance
3. Schedule Performance Index (SPI)
4. Cost Performance Index (CPI)
5. Expected time to complete (ETC)
6. Expected cost at complete (EAC)

Plot a graph of cumulative AC, PV and EV on graph paper provided

10

6

- A. Please explain differences between P & L statement and cash flow statement
- B. What is the difference between cash flow and free cash flow?
- C. What is the significance of Interest Coverage Ratio and Debt Service Coverage Ratio?
- D. From the following data, calculate Interest Coverage Ratio and Debt Coverage ratio for the firm for each year. Tax rate is 30%

Year	1	2	3	4	5
EBIT	20	25	30	35	40
Depreciation	10	8	6	4	2
Interest Outgo	5	4	3	2	1
Repayment of Term Loan	5	5	5	5	5

10

Healthy Foods Ltd. is engaged in the manufacture of biscuits. The company was established in year 2000 and has registered a steady growth in sales since then. Presently the company manufactures 20 different products and has an annual turnover of Rs.1000 million. The company is considering the manufacturing of a new chocolate cookie, for which the following information has been gathered:

Product is expected to have a product life cycle of five years and thereafter it would be withdrawn from the market. The sales for the cookie are expected to be as follows:

Year	Sales (Million)
1	100
2	150
3	200
4	150
5	100

The capital equipment required for manufacturing cookies is Rs.100 million and it will be funded from internal funds. It will be depreciated at the rate of 25% per year as per WDV method for tax purpose.

The expected net salvage value after 5 years is Rs. 20 million.

The working capital requirement for the project is expected to be 20% of sales. It will be funded from bank loan at the rate of 10%. At the end of 5 years, working capital is expected to be liquidated at par.

The accountant of the firm has provided the following cost estimates for the product:

Variable Raw material cost: 30% of sales

Variable labour cost: 20% of sales

Fixed cost: Rs. 5 million

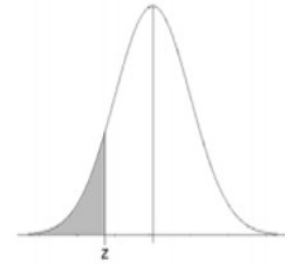
The tax rate applicable to the firm is 40%.

Calculate project cash flows for year 1 to 5 and NPV of the project

Present value of one rupee earned in year n at the rate of 10% is as below

Year	1	2	3	4	5
PV	0.91	0.83	0.75	0.68	0.62

Standard Normal Cumulative Probability Table



Cumulative probabilities for **NEGATIVE** z-values are shown in the following table:

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-3.4	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002
-3.3	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003
-3.2	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005
-3.1	0.0010	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0007	0.0007
-3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0010	0.0010
-2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
-2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
-2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
-2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
-2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
-2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
-2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
-2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
-2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
-2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
-1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
-1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
-1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
-1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
-1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
-1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
-1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
-1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
-1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
-1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
-0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
-0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
-0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
-0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451
-0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
-0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
-0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
-0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
-0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641