

Semester: Jan-Mar 2024									
Maximum Marks: 50	Examination: ESE Exam	Date: 26-03-24	Duration: 3	n: 3 Hours					
Programme code: 01 Programme: MBA (Ops)	Major			Class: SY	Semester/Trimester: VI				
College: K. J. Somaiya I	nstitute of Management		Name of the department/Section/Center: Operations and Supply Change Management						
Course Code: 217P01C61	2		Name of the Course: Projec	t 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	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.								
	Please prepare Project charte Project Purpose High-level Proj High-level Req Assumptions at High-level risk Summary miles Summary Budg Stakeholder list	er with following paragraphs or Justification eet description and boundar uirements ad constraints tone Schedule et	ies						
2	Activity and Precedence list	along with "Expected Time	" for completion and variance is given in b	elow table		10			
	Activity	Predecessor	Expected Time	Variance					
	A	-	2	2/6					
	В	-	3	2/6					
	С	Α	2	4/6					
	D	В	4	4/6					
	E	С	4	2/6					
	F	С	3	1/6					

	G	D, E		5	1/6					
	1. Draw project net	work 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 Crash Time Normal Cost \$ Crash Cost \$									
			(Months)	(Months)						
	А	-	10	8	2000	2400				
	В	-	7	5	3000	3500				
	С	А	9	8	1000	1300				
	D	В	6	4	2000	2600				
	Е	D	9	8	8800	9000				
	1. Please draw proje	ect network diagram								
	2. Calculate project	duration								
	3. Identify critical p	path								
	4. Determine the lea	ast cost to crash project by 3 me	onths							
	5. Can we crash the	project beyond 3 months? If ye	es, how much and a	at what cost?						
	6. What is the best	possible crash schedule and cos	st for it?							
4	Write short notes on an	y two					10			
	1. What is Project, 1	Program and Portfolio. Please e	explain with examp	les						
	2. What is RACI M	atrix. Please draw RACI Matrix	x for Placement pro	ocess						

5		A project with duration of 20 weeks was reviewed at the end of 10 weeks with status as follows									
		Week	Cumulative Planned	Cumula	ative Actual	Weekly Plan	ned cost	Weekly Actu	al cost		
			Completion	Con	npletion	Budge	t	incurre	d		
		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. Schedu	le Variance								
		2. Cost va	riance								
		3. Schedu	le Performance Index (SF	U.							
		4 Cont D	former and the former (CDI)	1)							
		5 –	erformance index (CPI)								
		J. Expect	ed time to complete (ETC)							
		O. Expect	ed cost at complete (EAC)							
		Plot a graph o	f cumulative AC, PV and	EV on gr	aph paper provi	ided					
6	A.	Please explain	n differences between P &	L stateme	ent and cash flo	w statement					10
	В.	What is the di	fference between cash flo	w and free	e cash flow?						
	C.	What is the si	gnificance of Interest Cox	erage Rat	io and Debt Ser	rvice Coveras	e Ratio?				
	D.										
	2.	Tiom are renowing data, calculate interest Coverage Ratio and Deor Coverage ratio for the infinitor each year. Tax falle is 30%									
		EBIT			20	25	30	35	40		
		Depreciatio	n		10	8	6	4	2		
		Interest Out	go		5	4	3	2	1		
		Repayment	of Term Loan		5	5	5	5	5		

7	Healthy Foods ltd. is engaged in the manufacture of biscuits. The company was established in year 2000 and has registered a steady growth							10
	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	e manufacturing o	of a new chocolat	e cookie, for whic	ch the following in	nformation has be	en gathered:	
	Product is expect	ed to have a prod	uct life cycle of f	ive years and the	reafter it would be	withdrawn from	the market. The sales for the cookie	
	are expected to b	e as follows:						
	Year Sales (Million)							
			1			100		
			2	2		150		
			3	3		200		
			2	Ļ		150		
			5	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 cap	ital requirement f	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, w	orking capital is	expected to be liq	uidated at par.				
	The accountant o	f the firm has pro	wided the followi	ing cost estimates	for the product:			
	Variable Raw ma	terial cost: 30% o	of sales					
	Variable labour c	ost: 20% of sales						
	Fixed cost: Rs. 5	million						
	The tax rate appl	cable to the firm	is 40%.					
	Calculate project	cash flows for ye	ear 1 to 5 and NP	V of the project				
	Present value of	one rupee earned	in year n at the ra	te of 10% is as b	elow			
	Year	1	2	3	4	5		
	PV	0.91	0.83	0.75	0.68	0.62		

Annexure I



STANDARD NORMAL TABLE (Z)

Entries in the table give the area under the curve between the mean and *z* standard deviations above the mean. For example, for z = 1.25 the area under the curve between the mean (0) and *z* is 0.3944.

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0190	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2969	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3513	0.3554	0.3577	0.3529	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998

Standard Normal Cumulative Probability 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
			100524			10000	1000501	0.0000		100
-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
4.4	0.0000	0.0702	0.0779	0.0764	0.0740	0.0725	0.0721	0.0709	0.0604	0.0691
-1.4	0.0000	0.0793	0.0024	0.0019	0.0004	0.0735	0.0721	0.0700	0.0094	0.0001
-1.3	0.0900	0.1131	0.1112	0.0910	0.0901	0.0000	0.0009	0.0000	0.0030	0.0025
-1.2	0.1357	0.1131	0.1314	0.1093	0.1075	0.1050	0.1030	0.1020	0.1003	0.0303
-1.0	0.1597	0.1555	0.1514	0.1292	0.1271	0.1251	0.1230	0.1210	0.1401	0.1170
-1.0	0.1007	0.1002	0.1000	0.1010	0.1452	0.1403	0.1440	0.1420	0.1401	0.1075
-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

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