ASSIGNMENT

Student Name:

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Student ID:
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SUBMITED TO:

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SUBJECT:

RISK AND DISASTER MGT:

IN CONSTRUCTION

Answer 1:

Risk Register:

A risk register is a document used as a risk management tool and to fulfill regulatory compliance acting as a repository for all risks identified and includes additional information about each risk, e.g. nature of the risk, reference and owner, mitigation measures. It can be displayed as a scatterplot or as a table.

A Risk Register can contain many different items. There are recommendations for Risk Register content made by the Project Management Institute Body of Knowledge (PMBOK) and PRINCE2 does not use the term risk register, however it does state that risks need to be documented.

There are many different tools that can act as risk registers from comprehensive software suites to simple spreadsheets. The effectiveness of these tools depends on their implementation and the organization's culture

A typical risk register contains:

- A risk category to group similar risks
- The risk breakdown structure identification number
- A brief description or name of the risk to make the risk easy to discuss
- The impact (or consequence) if event actually occurs rated on an integer scale
- The probability or likelihood of its occurrence rated on an integer scale
- The Risk Score (or Risk Rating) is the multiplication of Probability and Impact and is often used to rank the risks.
- Common mitigation steps (e.g. within IT projects) are Identify, Analyze, Plan Response, Monitor and Control.

The risk register is called "qualitative if the probabilities are estimated by ranking them, as "high" to "low" impact. It is called "quantitative" both the impact and the probability is put into numbers, e.g. a risk might have a "$1m" impact and a "50%" probability.

Contingent response - the actions to be taken should the risk event occur.

Contingency - the budget allocated to the contingent response

Trigger - an event that itself results in the risk event occurring (for example the risk event might be "flooding" and "heavy rainfall" the trigger)

ID	Date raised	Risk description	Risk			Without controls			Controls	Residual risk	Action
			H	M	L	Cost impact	Time impact	Other			
U-01	10/06/2019	Work Permit			L	100	10	Completion Date Exceed	Local Administration involvement	Mitigated	Correspondence
E-01	22/06/2019	Error in Quantity Survey	Y			2000	80	Cost Exceed	Estimate Correction	Mitigated	PC-1 Revised
MS-01	10/10/2019	Error in Method Statement	y			500	25	Rework	Early Rectification	Improved to the extend	Correspondence
U-02	15/07/2019	Unidentified utilities		M		400	30	Completion Date Exceed	Local Administration involvement	Mitigated	Correspondence
E-02	28/06/2019	Elevated Water Table		M		250	20	Cost Impact	Extra Work	Mitigated	Variation Order
D-01	05/7/2019	False Design	H			220	50	Cost & Delay	Early Submission	Improved to the extend	Revisions
E-03	17/07/2019	Material Delivery		M		700	65	Delay	Procurement Plan	Improved to the extend	Procurement Plan

Answer 2

Cost Benefit Analysis:

A cost benefit analysis (also known as a benefit cost analysis) is a process by which organizations can analyze decisions, systems, or projects, or determine a value for intangibles. The model is built by identifying the benefits of an action as well as the associated costs and subtracting the costs from benefits.

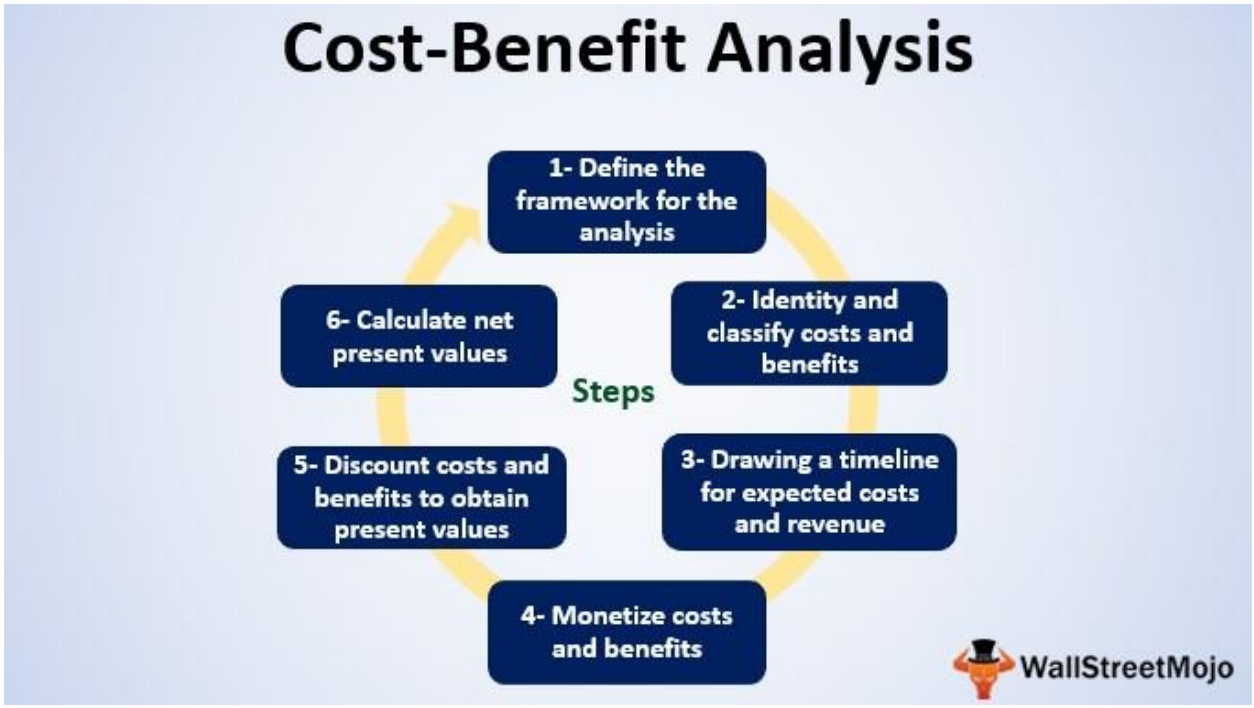
It became popular in the 1950s as a simple way of weighing up project costs and benefits, to determine whether to go ahead with a project. As its name suggests, Cost-Benefit Analysis involves adding up the benefits of a course of action, and then comparing these with the costs associated with it.

Cost benefit analysis is a process used primarily by businesses that weighs the sum of the benefits, such as financial gain, of an action against the negatives, or costs, of that action. The technique is often used when trying to decide a course of action, and often incorporates dollar amounts for intangible benefits as well as opportunity cost into its calculations.

CBA is an easy tool to determine which potential decision would make the most financial sense for the business or individual. The process also takes indirect benefits or costs into consideration, like customer satisfaction or even employee morale. And opportunity cost often plays a big role when deciding between several options. When listing potential costs and benefits, companies or analysts will often factor in things like labor costs, social benefits and other factors that may not be immediately obvious.

In most construction projects, factors other than money must be takeninto account. Ifa dam is built it might drown a historical monument, reduce the likelihood ofloss offline due to flooding, increase the growthofnew industry because ofthe reduced dam flooding risk, and so on.Cost–benefit analysis provides alogical framework for evaluating alternativefactors that may be highly conjectural in nature. If the analysis isconfined to purely financial considerations, it fails to recognize the overallsocial objective, to produce the greatest possible benefit for a given cost.At its heart lies the recognition that a factor should not be ignoredbecause it is difficult or even impossible to quantify it in monetary terms. Methods are available to express, for instance, the value of recreationalfacilities, and although it may not be possible to

put a figure on the valueof human life, it is surely not something we can afford to ignore. The essential costbenefit analysis is to consider all the factors, which influence either the benefits or the cost ofa project. Imaginationmust be used to assign monetary values to what at first sight might appearto beintangibles. It should be mentioned that monetary values are highlysubjective and must be evaluatedwith care. Even factors to which nomonetary value can be assigned must be taken into consideration. Theanalysis should be applied to projects of roughly similar size and patternsof cash flow. Those with the higher cost–benefit ratios will be preferred. The maximum net benefit ratio is marginally greater than the next mostfavored project. The scope of the secondary benefits to be taken intoaccount frequentlydepends on the viewpoint of the analyst. It is obvious that, in comparing alternatives, each project must bedesigned within itselfat the minimum cost that will allow the fulfilmentof objectives including theappropriate quality, level offer andprovision ofsafety.Perhaps more important, the viewpoint from which each project isassessed plays a critical part in properly assessing both the benefits andcostthat should be attributed to a project. For instance, ifa private electricityboard wishes to develop ahydroelectric power station, it will derive to benefit from the coincidental provision of additional public recreationalfacilities, which cannot therefore enter into its cost–benefit analysis. A public sector owner could quite properly include the recreational benefits in its cost–benefit analysis. Again, as far as the private developeris concerned, the cost labor is equal to the market rate ofremuneration, no matter what the unemployment level. For the public developerhowever, in times ofhigh unemployment, the economic cost labormay be nil, since the use labor in this project does not preclude the
use ofother labor for other purposes.



Advantages:
Cost benefit analysis can be a helpful tool for businesses or individuals to undertake when considering a new course of action.
Running a CBA for a potential decision can help visualize the implications and impact of that course of action and is often very helpful for smaller or medium-sized decisions that are more immediate in scope of time.

Disadvantages:
there are some disadvantages to practicing a CBA in certain circumstances. For bigger decisions with a longer time horizon, CBAs can sometimes fail to take into account other factors that might not be

significant in the short term but would impact the long term, like inflation, interest rates and other larger, more long-term factors. For these calculations, net present value or internal rate of return are often better methods to use.

Example:
It became popular in the 1950s as a simple way of weighing up project **costs** and **benefits**, to determine whether to go ahead with a project. As its name suggests, **Cost-Benefit Analysis** involves adding up the **benefits** of a course of action, and then comparing these with the **costs** associated with it.

Cost benefit ratio = Benefit/ Cost

option 1	**Option 2**
➢ **cost would include**	
construction cost = $ 24,000,000	$ 14,000,000
sales office cost = $ 1,000,000	$ 2,000,000
cost of sales stuff = $ 400,000	$ 15,000
financing cost = $ 4,000,000	$ 1,500,000
➢ **Benefits would include**	
income from rentals = $ 1,500,000	$ 437,500
income from rentals =$ 25,000,000	$ 19,250,000
income from sales after rental = $3,000,000	$ 1,750,000
Total benefits = $ 29,500,000	$21,437,500
b/c ratio = 29,500,000/ 29,400,000 = 10	= 21,437,500/17650,000= 1.2
option 1 Benefits out weight the costs	

comparing both options together it is clear that option 2 has a higher benefit to cost ratio and cost less to execute and would therefore be the most fiscally resourceful option for the develop to pick.

Answer 3(a)

Normal Probability Distribution:
Normal distribution, also known as the Gaussian distribution, is a probability distribution that is symmetric about the mean, showing that data near the mean are more frequent in occurrence than data far from the mean. In graph form, normal distribution will appear as a bell curve.

A normal distribution is defined by the pdf

The Normal pdf:

$$y = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

$$\mu = \text{Mean}$$
$$\sigma = \text{Standard Deviation}$$
$$\pi \approx 3.14159\cdots$$
$$e \approx 2.71828\cdots$$

Important things about at the normal distribution

- There are infinitely many variations of the normal distribution differentiated by μ and σ^2
- The highest point of a normal is at the mean which is also the median.
- The normal distribution is symmetric. (i.e. around the mean, μ).

- Exactly half of the values are to the left of center and exactly half the values are to the right
- A normal distribution is the proper term for a probability bell curve.
- In a normal distribution the mean is zero and the standard deviation is 1.

Answer 3(b):

Given Data :
mean μ = 60000 PKR
standard deviation σ = 15000 PKR
x≤45,000

Required:
The portion of the area under the normal curve from 45 all the way to the left?
Z-Score table at the end of the paper (Table 2)?

SOLUTION:

Z= (x-u)/ σ ----------1
Put value in equ 1
Z=(45000-60,000)/15,000
=-1.00
What is P(Z=-1.00)
From table 2 we have **(.15866)**
P(X<45,000)=P(Z<-1.00)=.15866=16%

Z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
-3.9	.00005	.00005	.00004	.00004	.00004	.00004	.00004	.00004	.00003	.00003
-3.8	.00007	.00007	.00007	.00006	.00006	.00006	.00006	.00005	.00005	.00005
-3.7	.00011	.00010	.00010	.00010	.00009	.00009	.00008	.00008	.00008	.00008
-3.6	.00016	.00015	.00015	.00014	.00014	.00013	.00013	.00012	.00012	.00011
-3.5	.00023	.00022	.00022	.00021	.00020	.00019	.00019	.00018	.00017	.00017
-3.4	.00034	.00032	.00031	.00030	.00029	.00028	.00027	.00026	.00025	.00024
-3.3	.00048	.00047	.00045	.00043	.00042	.00040	.00039	.00038	.00036	.00035
-3.2	.00069	.00066	.00064	.00062	.00060	.00058	.00056	.00054	.00052	.00050
-3.1	.00097	.00094	.00090	.00087	.00084	.00082	.00079	.00076	.00074	.00071
-3.0	.00135	.00131	.00126	.00122	.00118	.00114	.00111	.00107	.00104	.00100
-2.9	.00187	.00181	.00175	.00169	.00164	.00159	.00154	.00149	.00144	.00139
-2.8	.00256	.00248	.00240	.00233	.00226	.00219	.00212	.00205	.00199	.00193
-2.7	.00347	.00336	.00326	.00317	.00307	.00298	.00289	.00280	.00272	.00264
-2.6	.00466	.00453	.00440	.00427	.00415	.00402	.00391	.00379	.00368	.00357
-2.5	.00621	.00604	.00587	.00570	.00554	.00539	.00523	.00508	.00494	.00480
-2.4	.00820	.00798	.00776	.00755	.00734	.00714	.00695	.00676	.00657	.00639
-2.3	.01072	.01044	.01017	.00990	.00964	.00939	.00914	.00889	.00866	.00842
-2.2	.01390	.01355	.01321	.01287	.01255	.01222	.01191	.01160	.01130	.01101
-2.1	.01786	.01743	.01700	.01659	.01618	.01578	.01539	.01500	.01463	.01426
-2.0	.02275	.02222	.02169	.02118	.02068	.02018	.01970	.01923	.01876	.01831
-1.9	.02872	.02807	.02743	.02680	.02619	.02559	.02500	.02442	.02385	.02330
-1.8	.03593	.03515	.03438	.03362	.03288	.03216	.03144	.03074	.03005	.02938
-1.7	.04457	.04363	.04272	.04182	.04093	.04006	.03920	.03836	.03754	.03673
-1.6	.05480	.05370	.05262	.05155	.05050	.04947	.04846	.04746	.04648	.04551
-1.5	.06681	.06552	.06426	.06301	.06178	.06057	.05938	.05821	.05705	.05592
-1.4	.08076	.07927	.07780	.07636	.07493	.07353	.07215	.07078	.06944	.06811
-1.3	.0968	.0951	.0934	.0917	.0901	.0885	.0869	.0853	.0837	.0822

	0	0	2	6	2	1	1	4	9	6
-1.2	.1150 7	.1131 4	.1112 3	.1093 5	.1074 9	.1056 5	.1038 3	.1020 4	.1002 7	.0985 3
-1.1	.1356 7	.1335 0	.1313 6	.1292 4	.1271 4	.1250 7	.1230 2	.1210 0	.1190 0	.1170 2
-1.0	.1586 6	.1562 5	.1538 6	.1515 1	.1491 7	.1468 6	.1445 7	.1423 1	.1400 7	.1378 6
-0.9	.1840 6	.1814 1	.1787 9	.1761 9	.1736 1	.1710 6	.1685 3	.1660 2	.1635 4	.1610 9
-0.8	.2118 6	.2089 7	.2061 1	.2032 7	.2004 5	.1976 6	.1948 9	.1921 5	.1894 3	.1867 3
-0.7	.2419 6	.2388 5	.2357 6	.2327 0	.2296 5	.2266 3	.2236 3	.2206 5	.2177 0	.2147 6
-0.6	.2742 5	.2709 3	.2676 3	.2643 5	.2610 9	.2578 5	.2546 3	.2514 3	.2482 5	.2451 0
-0.5	.3085 4	.3050 3	.3015 3	.2980 6	.2946 0	.2911 6	.2877 4	.2843 4	.2809 6	.2776 0
-0.4	.3445 8	.3409 0	.3372 4	.3336 0	.3299 7	.3263 6	.3227 6	.3191 8	.3156 1	.3120 7
-0.3	.3820 9	.3782 8	.3744 8	.3707 0	.3669 3	.3631 7	.3594 2	.3556 9	.3519 7	.3482 7
-0.2	.4207 4	.4168 3	.4129 4	.4090 5	.4051 7	.4012 9	.3974 3	.3935 8	.3897 4	.3859 1
-0.1	.4601 7	.4562 0	.4522 4	.4482 8	.4443 3	.4403 8	.4364 4	.4325 1	.4285 8	.4246 5
-0.0	.5000 0	.4960 1	.4920 2	.4880 3	.4840 5	.4800 6	.4760 8	.4721 0	.4681 2	.4641 4

Z	**.00**	**.01**	**.02**	**.03**	**.04**	**.05**	**.06**	**.07**	**.08**	**.09**
-3.9	.0000 5	.0000 5	.0000 4	.0000 4	.0000 4	.0000 4	.0000 4	.0000 4	.0000 3	.0000 3
-3.8	.0000 7	.0000 7	.0000 7	.0000 6	.0000 6	.0000 6	.0000 6	.0000 5	.0000 5	.0000 5
-3.7	.0001 1	.0001 0	.0001 0	.0001 0	.0000 9	.0000 9	.0000 8	.0000 8	.0000 8	.0000 8
-3.6	.0001 6	.0001 5	.0001 5	.0001 4	.0001 4	.0001 3	.0001 3	.0001 2	.0001 2	.0001 1
-3.5	.0002 3	.0002 2	.0002 2	.0002 1	.0002 0	.0001 9	.0001 9	.0001 8	.0001 7	.0001 7
-3.4	.0003 4	.0003 2	.0003 1	.0003 0	.0002 9	.0002 8	.0002 7	.0002 6	.0002 5	.0002 4
-3.3	.0004 8	.0004 7	.0004 5	.0004 3	.0004 2	.0004 0	.0003 9	.0003 8	.0003 6	.0003 5
-3.2	.0006 9	.0006 6	.0006 4	.0006 2	.0006 0	.0005 8	.0005 6	.0005 4	.0005 2	.0005 0
-3.1	.0009 7	.0009 4	.0009 0	.0008 7	.0008 4	.0008 2	.0007 9	.0007 6	.0007 4	.0007 1
-3.0	.0013 5	.0013 1	.0012 6	.0012 2	.0011 8	.0011 4	.0011 1	.0010 7	.0010 4	.0010 0
-2.9	.0018 7	.0018 1	.0017 5	.0016 9	.0016 4	.0015 9	.0015 4	.0014 9	.0014 4	.0013 9
-2.8	.0025 6	.0024 8	.0024 0	.0023 3	.0022 6	.0021 9	.0021 2	.0020 5	.0019 9	.0019 3
-2.7	.0034 7	.0033 6	.0032 6	.0031 7	.0030 7	.0029 8	.0028 9	.0028 0	.0027 2	.0026 4

-2.6	.0046	.0045	.0044	.0042	.0041	.0040	.0039	.0037	.0036	.0035
	6	3	0	7	5	2	1	9	8	7
-2.5	.0062	.0060	.0058	.0057	.0055	.0053	.0052	.0050	.0049	.0048
	1	4	7	0	4	9	3	8	4	0
-2.4	.0082	.0079	.0077	.0075	.0073	.0071	.0069	.0067	.0065	.0063
	0	8	6	5	4	4	5	6	7	9
-2.3	.0107	.0104	.0101	.0099	.0096	.0093	.0091	.0088	.0086	.0084
	2	4	7	0	4	9	4	9	6	2
-2.2	.0139	.0135	.0132	.0128	.0125	.0122	.0119	.0116	.0113	.0110
	0	5	1	7	5	2	1	0	0	1
-2.1	.0178	.0174	.0170	.0165	.0161	.0157	.0153	.0150	.0146	.0142
	6	3	0	9	8	8	9	0	3	6
-2.0	.0227	.0222	.0216	.0211	.0206	.0201	.0197	.0192	.0187	.0183
	5	2	9	8	8	8	0	3	6	1
-1.9	.0287	.0280	.0274	.0268	.0261	.0255	.0250	.0244	.0238	.0233
	2	7	3	0	9	9	0	2	5	0
-1.8	.0359	.0351	.0343	.0336	.0328	.0321	.0314	.0307	.0300	.0293
	3	5	8	2	8	6	4	4	5	8
-1.7	.0445	.0436	.0427	.0418	.0409	.0400	.0392	.0383	.0375	.0367
	7	3	2	2	3	6	0	6	4	3
-1.6	.0548	.0537	.0526	.0515	.0505	.0494	.0484	.0474	.0464	.0455
	0	0	2	5	0	7	6	6	8	1
-1.5	.0668	.0655	.0642	.0630	.0617	.0605	.0593	.0582	.0570	.0559
	1	2	6	1	8	7	8	1	5	2
-1.4	.0807	.0792	.0778	.0763	.0749	.0735	.0721	.0707	.0694	.0681
	6	7	0	6	3	3	5	8	4	1
-1.3	.0968	.0951	.0934	.0917	.0901	.0885	.0869	.0853	.0837	.0822
	0	0	2	6	2	1	1	4	9	6
-1.2	.1150	.1131	.1112	.1093	.1074	.1056	.1038	.1020	.1002	.0985
	7	4	3	5	9	5	3	4	7	3
-1.1	.1356	.1335	.1313	.1292	.1271	.1250	.1230	.1210	.1190	.1170
	7	0	6	4	4	7	2	0	0	2
-1.0	.1586	.1562	.1538	.1515	.1491	.1468	.1445	.1423	.1400	.1378
	6	5	6	1	7	6	7	1	7	6
-0.9	.1840	.1814	.1787	.1761	.1736	.1710	.1685	.1660	.1635	.1610
	6	1	9	9	1	6	3	2	4	9
-0.8	.2118	.2089	.2061	.2032	.2004	.1976	.1948	.1921	.1894	.1867
	6	7	1	7	5	6	9	5	3	3
-0.7	.2419	.2388	.2357	.2327	.2296	.2266	.2236	.2206	.2177	.2147
	6	5	6	0	5	3	3	5	0	6
-0.6	.2742	.2709	.2676	.2643	.2610	.2578	.2546	.2514	.2482	.2451
	5	3	3	5	9	5	3	3	5	0
-0.5	.3085	.3050	.3015	.2980	.2946	.2911	.2877	.2843	.2809	.2776
	4	3	3	6	0	6	4	4	6	0
-0.4	.3445	.3409	.3372	.3336	.3299	.3263	.3227	.3191	.3156	.3120
	8	0	4	0	7	6	6	8	1	7
-0.3	.3820	.3782	.3744	.3707	.3669	.3631	.3594	.3556	.3519	.3482
	9	8	8	0	3	7	2	9	7	7
-0.2	.4207	.4168	.4129	.4090	.4051	.4012	.3974	.3935	.3897	.3859
	4	3	4	5	7	9	3	8	4	1
-0.1	.4601	.4562	.4522	.4482	.4443	.4403	.4364	.4325	.4285	.4246
	7	0	4	8	3	8	4	1	8	5

P(X<45,000)=P(Z<-1.00)=.15866=16%