Course No:CON 5399
Course Title: Special Course in Construction Management
Date: 17/1/2019
No. of Questions: (3)
Time: 2 Hours
Using Calculator (No)

University of Palestine

Final Exam
17th Jan.2018
Total Grade: 50

Instructor Name: Dr. Nadine Abu-Shaaban
Student No.: _____
Student Name: _____
College Name: _____
Dep. / Specialist: _____
Using Dictionary (No)

Question One:

a) Given the following data for a project: ***(17 Marks)***

Activity	Predecessor	Optimistic Estimate	Most probable Estimate	Pessimistic Estimate
A	-	1	2	3
B	A	2	3.5	8
C	B	6	9	18
D	C	4	5.5	10
E	C	1	4.5	5
F	E	4	4	10
G	D	5	6.5	11
H	G,E	5	8	17
I	C	3	7.5	9
J	I,F	3	9	9
K	J	4	4	4
L	J	1	5.5	7
M	H	1	2	3
N	L,K	5	5.5	9

1. Find the critical path.
2. Calculate the expected time and variance for each activity.
3. Determine the expected project completion time and the project variance.
4. Find the probability that the project will be completed in 47weeks or less.
5. Find the probability that the project will be completed in 40weeks or less.

QuestionTwo:

Draw the precedence diagram for the following data. ***(4 Marks)***

		Cost ($)		***Duration (months)***	
Activity	***Preceded by***	***Crash***	***Normal***	***Crash***	***Normal***
A	-	7200	7000	10	12
B	A	5300	5000	6	8
C	A	4600	4000	12	15
D	B	5000	5000	23	23
E	B	1050	1000	4	5
F	C	3300	3000	4	5
G	E,C	6300	6000	15	20
H	F	2580	2500	11	13
I	D,G,H	3150	3000	10	12

a) It is required to crash the schedule to a 57month. How much more would the project cost?

b) Assume that the project manager desires a 50-month project; formulate a Linear Programming Model that can be used to make the Crashing Decision for the Project. (State the Objective Function and Constraints Clearly).
(15 Marks)

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QuestionThree:

a) Acity public works department is planning for a new water supply project.Water from a nearby aquifer is available in adequate supply, but its hardness level is too high unless it is blended with a lower hardness source. The total-Kilograms of hardness per million cubic meters are limited to 1200 in the final blended supply.
Water from a distant stream is of sufficient quality, but the cost to pump it is quite high. The city is planning to get the water from three sources: the current supply; the aquifer; and the distant stream. The cost to get water (NIS) per million cubic (mm^3) meters and the hardness in Kilograms per m m^3 is given below:

	Source 1	*Source 2*	*Source 3*
Cost (NIS/ m m^3)	500	1000	2000
Supply limit (m m^3)	25	120	100
Hardness (Kg/m m^3)	200	2300	700

A total of 150 million cubic meter of water is needed per day by the end of ten years. *Formulate a mathematical model to determine the least-cost strategy for supply water while ensuring that the water supply remains of acceptable quality.*

(6 Marks)

b) Outline the primary characteristics of the organizational culture.***(2 Marks)***
c) Describe the Managerial Grid-Leadership Styles.***(3 Marks)***
d) What are the principles of LEAN?***(3 Marks)***

End of Questions

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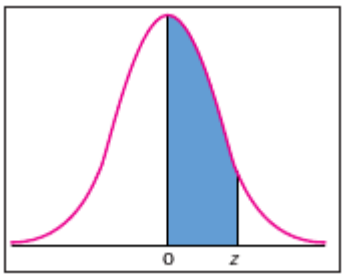

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1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
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2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936