Minoufiya University
Faculty of Engineering
Shebin El-Kom
First Semester Examination
Academic year: 2014 – 2015
Date: 22 / 1 / 2015

Dept: Production Engineering
Year: Third
Subject: Project planning and Management
Code: PRE316
Time Allowed: 2 hours
Total Marks: 40 Marks

Answer the Following Questions:

Question No [1]: **(10 Marks)**

a – Differentiate between production and productivity.

b- What are the different technology based productivity improvement techniques.

c- A company for manufacturing certain product has the following data through two Weeks:

Week No.	Number of produced unit	Number of workers	Raw materials, Kg
1	300	6	45
2	338	7	46

Assume

- The working hours per week = 40 hrs.
- The labor wage per hour. = 12 L. E
- Material cost per kg. = 6 L.E
- Selling price per unit = 140 L.E
- The overhead cost = 150% of the weekly labor wage.

Required:

i- Calculate the multiple productivity index for the two weeks.

ii- Determine the change in the productivity between the two weeks.

Question No [2]: **(10 Marks)**

a – Mechanical equipment can be arranged in a number of ways. What are the most common configuration used. Show your answer with drawing.

b- With the aid of neat sketch show a simplified production system.

c- Find the sequence that minimizes the total elapsed time in hours required to complete the following Jobs on two machines M and N in the order NM. Also compute that minimum time.

Job	Time required , hrs	
	Machine M	Machine N
A	6	3
B	2	7
C	10	8
D	4	9
E	11	5

Question 3 :- **(10 marks)**

Assume a project completion time of thirty – one days , from the data below , perform the following :-

1- Draw the PERT network .

2- Compute ES , EF , LS and LF .

3- Determine the critical path as well as the total slack and free slack per each activity .

4- What is the probability the project will be completed within thirty days .

5- What is the probability the project will require more than thirty – three days .

Activity	Immediate predeccessor	Estimated times (days)		
		a	m	b
A	-	1	2	3
B	A	4	6	8
C	A	7	8	15
D	B	2	5	8
E	C , B	3	6	9
F	E	3	4	11
G	D	9	9	15
H	F , G	4	7	16

Question 4 : (10 marks)

By using data below , determine the following :

1- The optimum transport schedule .

2- The total transport cost

(Applying Vogel's Approximation Method comparing with the Index method)

From \ To	Destination A	Destination B	Destination C	Supply
Source 1	8	9	4	72
Source 2	5	6	8	38
Source 3	7	9	6	46
Source 4	5	3	7	19
Demand	110	34	31	175

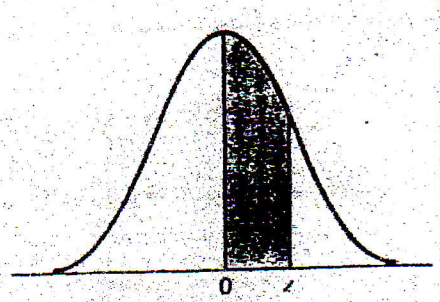

TABLE 1
Areas of a standard normal distribution[a]

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	0.0199	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	0.2234
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	0.2703	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	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	0.3531	0.3554	0.3577	0.3599	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	0.3862	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

[a]An entry in the table is the proportion under the entire curve which is between $z = 0$ and a positive value of z. Areas for negative values of z are obtained by symmetry.