United International University (UIU)

Term Final Examination

IPE 401: Industrial Management

Summer Trimester: 2018

Total time: 2:00 hours Date: 20/09/2018 Total marks: 40

Section: A/B/C/D

There are 5 questions. You must answer question **1** & **2** and any two of **3, 4 & 5.**

1 (a) Draw a **Pareto** chart with the following data, and identify the 80% zone **[4] [CO3]**

Defect Type	Frequency
Chip	700
Bubble	980
Run	250
Scratch	1100
Scrape	420
others	100

(b) 1. You are a student of UIU and your result was very poor in the Mid Term exam. So you wanted to improve your result in the final and you wanted to draw a Fish bone Diagram about how u got **bad grade in exam**. These are the reasons you found out to be the cause of your bad grade. **[6] [CO3]**

- You were late for school because your alarm was set at wrong time.
- Your calculator was malfunctioning and the buttons were hard to press
- You did not study enough for the exam
- The invigilator was talking too much and breaking your concentration
- It was raining outside which made you feel that , it was better to be a poet than an Engineer and got distracted
- The Simplex method done by you which you learnt from the You tube was not correct.

2 Consider the following problem and solve it by using Simplex method. **[10] [CO4]**

Maximize , $Z = 3w_1 + 2w_2$

Subject to,

$w_1 \leq 4$

$w_1 + 3w_2 \leq 15$

$2w_1 + w_2 \leq 10$

$w_1 \geq 0, w_2 \geq 0$

3 (a) Suppose you are working in a steel mill where you need to make a control chart with the steel rod diameter. Rod's specification: 25 ± 1 (mm). Draw a **Control** chart with the following data, and identify the points that are caused by assignable causes. **[4] [CO3]**

Sl No	Rod diameter
1	25.6
2	24.5
3	24
4	25.9
5	26.2
6	25
7	24.8
8	23.6
9	25
10	24.1

(b) Suppose Mr. Jon Snow wants to make 5 type of knifes from a material called dragon glass. First you need to cut the glasses in shapes and then you need to do some drilling on them. But he doesn't know how to sequence his job and you are a friend of him, who has studied IPE 401 course and know how to apply Johnson's rules for sequencing the jobs. Now sequence the jobs and draw the "**Gant Chart**" and calculate the idle time. **[6] [CO2]**

Job	Processing Time for Jobs (Days)	
	Work Station 1 (Cutting)	Work Station 2 (drilling)
A	5	3
B	8	2
C	4	1
D	7	8
E	12	6

4 (a) **(i)**Mr. Gendry Barathion is a black smith of Kings landing. His Customer Mr. Robert ordered a 2 m long sword. Gendry made the sword, but it was 2.2m long. But before delivering it to Mr. Robert, he found out the defect and he had to cut the extra length for making it to proper size. Gendry had to spend $5 for this extra work. So what kind of **quality cost** Gendry had to bear? Explain. **[4] [CO3]**
(ii) So what kind of **Quality loss function curve** is appropriate for the given quality characteristics (length of the sword) ?Explain

(b) During the past 8 years the port of Baltimore has unloaded large quantities of grain.(α=0.3) The forecast of 2012 was 369unit . Find the forecast for the 2017 and 2011. **[6] [CO2]**

Year	2009	2010	2011	2012	2013	2014	2015	2016
Actual	395	359	379	389	398	378	387	396

5 (a) Mr. Bodi is an analyst of an Orange juice factory. He controls the PH of the juice that is made there. The specification limit is 6.5 ±0.2. One day he took 5 samples for testing .Those are, **[4] [CO3]**

SL No	1	2	3	4	5
PH level	6.6	6.7	6.65	6.54	6.38

The sample mean has shifted from the expected value and to correct the PH level, he has to bear $4 dollar per sample. So what will be his total loss? Show with proper calculations and formulae.

(b) The demand for electrical power at EGCB over the year 2007-2013 is given. Find the **overall trend**. Also find the demand of power at year 2101. **[6] [CO2]**

Year	2007	2008	2009	2010	2011	2012	2013
Demand	1100	1115	1190	1200	1240	1170	1315

CO2	Analyze various industrial problems by using operation management, technique, operation research technique and cost accounting technique and solve it.
CO3	Explain the importance of quality control, and various industrial engineering techniques to improve the process in any engineering sector and how this affect the organization and customers
CO4	Analyze the optimization problems and solve it by using graphical method or simplex method