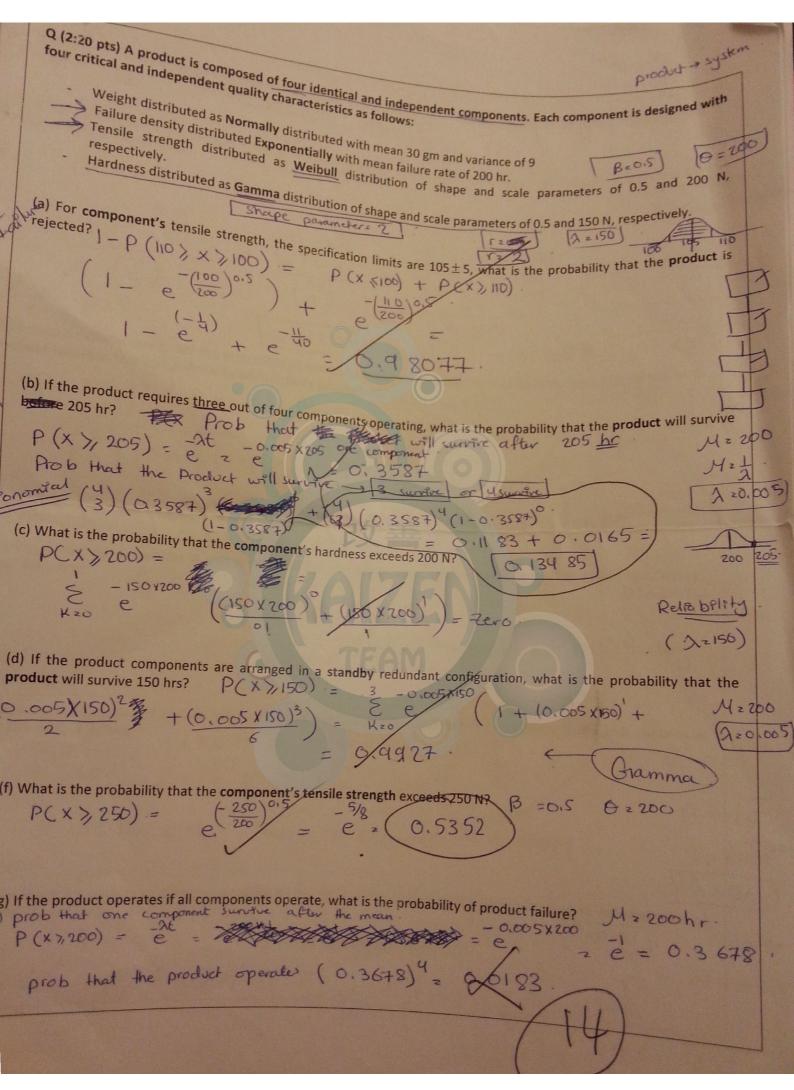
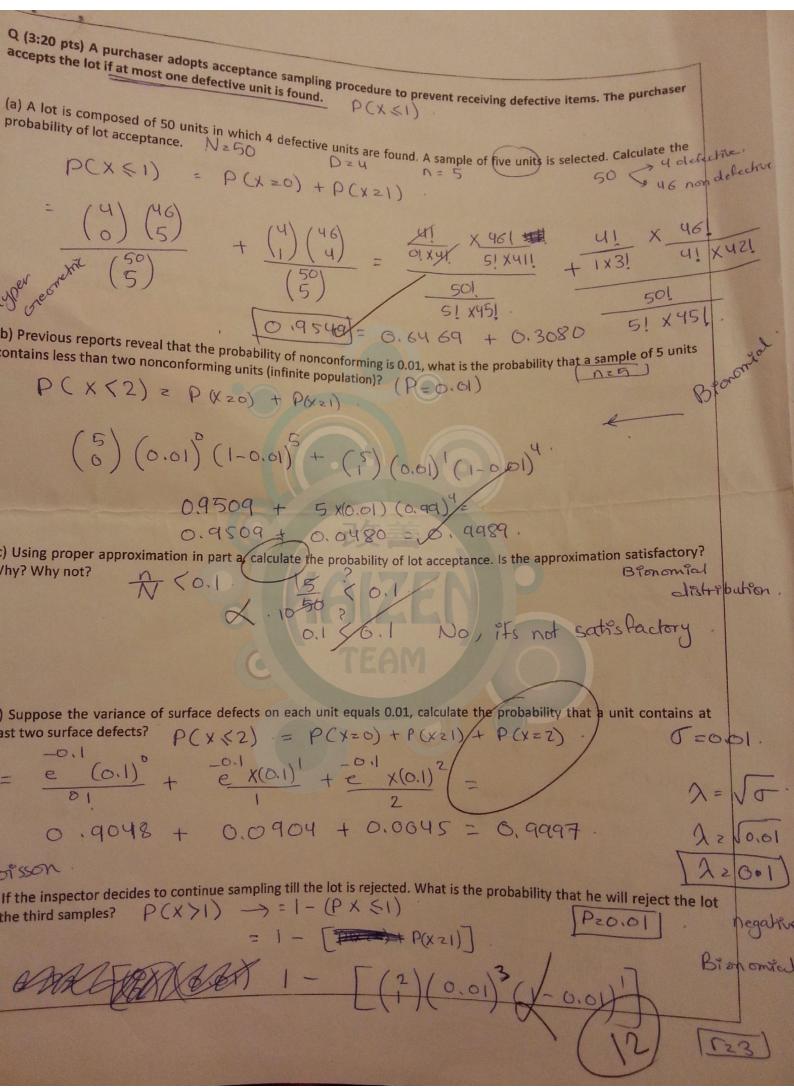
O 9/11/2013	1D: Section: 10-11
Q (1: 15 pts) Please state whether	Section:
Quality improvement is the reduction.	Section: O-11.  ent is True/False. Please underline the false part then correct it.  Pability in processes and products. (1) variability
2. Reliability is a critical-to-quality of	ability in processes and products. (I) variability
<ol> <li>Reliability is a <u>critical-to-quality characteristi</u></li> <li>The upper specification limit is the largest value.</li> </ol>	d: (F) Pimension of Quality
Acceptance sampling is the least of	alue for the quality characteristic of the product.
- Coults in 3 d	narte and the total and the to
purchased material. T	with measuring, evaluating, or auditing products, components, and
7. Warranty costs are an example of external p	production costs [ [ Cool ] ]
8. Training is an example of prevention costs.	(TI)
<ol><li>Box plot is a more compact summary of data</li></ol>	a than numerical measures
10. Histograms are best suited for data sets.	(F) large data sets
11. A process that is operating with only assigna	ble causes of variation present is said to be in control. (F) out so control
12. The control charts consists of three parameter	ers; upper control limit, lower control limit, and target. (F) center line
	on of numerical data arranged by category. (F) a Hribute symbol
L4. In phase I, trial control charts are established	to monitor future production.
L5. Check sheet is a useful plot for identifying a p	potential relationship between two variables. (F) Scatter diagram
(2:10 pts) Please determine the proper probal	pility distribution for the following cases:
	es from a lot of 1000 which contains 50 defectives. The probability of ulated using Hyper Greenethic distribution.
	er of surface defects appear on a white board. The probability of product
The reliability of electronic component with a curvival a specific number of hours will be estimated	constant time to failure is of main interest. The probability of component
An inspector of welded joints decides to stop in the Art of the first defective weld by the fifth same	inspection when he/she finds the first defective weld. The probability
The probability of finding a percentage of broke	en tubes in a definite sample size is calculated using browning.
	10 Storement.

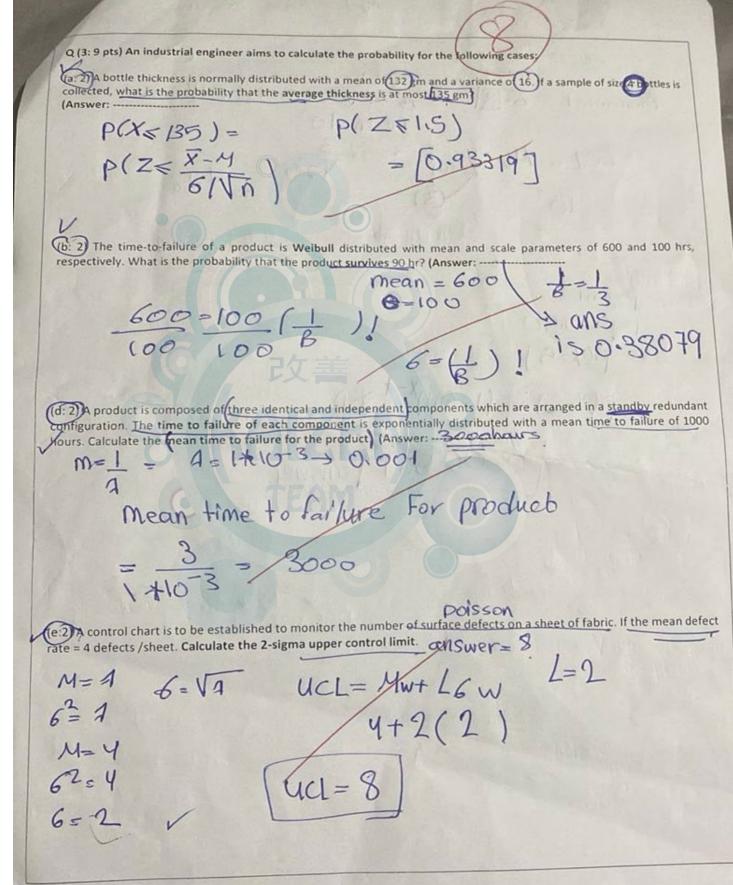


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_	19+12 (31/30)
De	he University of Jordan  epartment of Industrial Engineering uality Control Midterm Exam 9/8/2023
pai	(1: 12pts) Please state whether each of the following statements is True/False. Please correct the false underlined rt.  The control chart only detects chance causes. (False.) assimable Gauses.
	catter diagram is a simple frequency distribution of attribute data arranged by category. (Fake pareto ) ontrol charts prevent necessary process adjustment. (Fake.) upites sary:
	ne sample standard deviation measures the central tendency of the data. Take I measure Variability
1 The	e cause-and-effect diagram is analyzed to determine whether the location of the defects on the unit conveys any eful information about the potential causes of the defects. (FAISE) defect concentration diagram
,	e existence of assignable causes results in a random pattern. (False, nontrondom pattern.)  e 2-sigma control limits are called the action limits (False Working limits.)
	cyclic pattern is a random pattern. (False) non Tandom.)
1	eck sheet is a useful plot for identifying a potential relationship between two variables. (False) Scatter) diagram.
lim	phase I, a set of process data is gathered and analyzed all at once in a retrospective analysis, constructing trial control nits. (
	histogram is a more compact summary of data than a stem-and-leaf plot. (
WI	hen the assignable cause affects the process, the product is concluded out of control. (Figure OF control)



sample size Tallen. (f: 2) An industrial engineer monitor the number of nonconforming bottles in a sample size of 100 ottle. The probability of a nonconforming bottle is constant and equal 0.1 Twenty samples are selected. Calculate the LCL of the appropriate control chart. Answer \$ 2= 100 x 0.1 x (1-0.1) Cower Bionomial mean=10 LCL= MW-LGW (g:2) An inspector decides to continue to checking till finding the first nonconforming bottle. The probability of a nonconforming bottle = 0.1. Calculate the probability that the inspector will check exactly 5 bottles.

The Living of Lordan	(D) 1-81
The University of Jordan Industrial Engineering Departm	ient Ast
tatistical Quality Control (First Exam 20 %):(1st)2023/2024	Instructor: Prof. Abbas Al-Refaie
ID:	

of the following statements is True/False. Please correct the false part.

Q1 (10 pts: 15 min) Please state whether each of the following statements is True/False. Please col	Answer/Correction
Statement	_
The cost incurred for materials and services consumed in testing belongs to appraisal costs.	True
The Motorola Six Sigma concept, the ± 3 σ results in 66810 parts per million non-defective.	defectives
Control charts aim to discover the key variables influencing quality characteristics of interest in the process.	Designed experime
The cost of retesting products that have undergone rework or other modifications is classified as prevention costs.	CC 3
The cost of correcting nonconforming units so that they meet specifications is considered a prevention cost.	
Quality characteristics are often evaluated relative to <u>variability</u> .	specificat
Paint containers that are overfilled because of excessive variability in the filling equipment result is quality losses.	Vinternal of
The net losses of labor and overhead resulting from defective products that cannot be repaired ar prevention costs.	e internal
DFSS is the set of activities that ensures the quality levels of products and services are properly maintained and that supplier and customer quality issues are properly resolved.	y quality as
Items in a rejected lot may be reworked or replaced with good units. This is often called ongoir inspection.	e rectifyin
The "fitness for use" definition has become associated more with the design aspect of quality the conformance.	an nonconform
Reliability is a sensory critical-to-quality characteristic.	Time-orie
The cost of preshipment operation of the product to prevent early-life failures in the field is an example internal failure costs.	- C
In Generation II, Six Sigma focuses on creating value throughout the organization and for stakeholders.	its TIL
The cost incurred during product design that is intended to improve the overall quality of the product design that is intended to improve the overall quality of the product design that is intended to improve the overall quality of the product design that is intended to improve the overall quality of the product design that is intended to improve the overall quality of the product design that is intended to improve the overall quality of the product design that is intended to improve the overall quality of the product design that is intended to improve the overall quality of the product design that is intended to improve the overall quality of the product design that is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product design that it is intended to improve the overall quality of the product	ict preventure Costs
GAMs software is used to plot box plots and histograms.	Minitab.

## (Q2: 20 min) Please answer the following questions.

(a: 2.5 pts) A random sample of size n products was randomly selected from an infinite lot. It is known that the probability that a specific component is conforming = 0.80. If the mean of the distribution = 1. Estimate the probability of finding at least one nonconforming product.

Answer = 0.6723 Distribution Bin 6Mia

$$D = 0.2$$

$$D = 0.2$$

$$D = 0.2$$

$$D = 0.5$$

$$D = 0.3277 = 0.3277 = 0.3277 = 0.00$$

(b: 2.5 pts) A random sample was randomly collected from a production lot. The quality control has decided to continue the inspection process till finding 2 nonconforming units. If the mean of the distribution = 20. Calculate the probability that the inspector inspects exactly 10 units.

Answer = 0.03874 | Distribution - Negative Binomial

$$V = 2$$
 $V = 2$ 
 $V = 10$ 
 $V = 20$ 
 $V = 10$ 
 $V =$ 

(c: 2.5 pts) A production process operates with 2% nonconforming output. Every hour a sample of n units of product is taken, and then the sample fraction defective is calculated. The variance of the distribution = 0.00196. Calculate the probability that the sample fraction defective is at most 0.15.

Answer = 
$$0.9833$$
 Distribution Binomial

$$P = 2\%$$

$$C = P(1-P) = 0.00196$$

$$P(P \le 0.15) = P(X \le 1.5)$$

$$P(X \le 1.5) = P(X = 1) = \begin{pmatrix} 10 \\ 0 \end{pmatrix} P(1-P) =$$

(d: 2.5 pts) An electronic display is subjected to a final functional test. Defects occur randomly at a variance of 0.005 per bottle. Calculate the probability that a display has more than 2 defects.

Answer = 
$$\frac{2.076 \times 10^{-8}}{10^{-8}}$$
 Distribution  $\frac{1}{10^{-8}}$   $\frac{1}{10^$