Problem 1 Fill in the missing values and answer the related questions.

Analysis of Variance for Measure

Source DF SS MS F P

Machine 2.1946 0.7315 2.16 0.133

Shift 7.5938 0.000

Machine\*Shift 3 7.5713 2.5238 0.002

Error 0.3388

Total 23 22.7796

What is the decision for Shift? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How many machines were included in the data set?

Is the interaction between Machine and Shift significant?

Was this a 3X2 design?

What is the total number of items in the data set?

Problem 2 Circle the correct choice.

T F When the p-value is 0.04, the data support HO.

T F In a 3X2 design, there were three levels of Factor 2.

T F If the DF for workers is 4, there were 5 workers in the data set.

T F An R-square of 0.5 indicates a strong relationship between the two variables in a simple linear regression.

T F The DF Regression for a simple linear regression ANOVA is 2.

T F The Total DF for a one-way ANOVA equals the number of items in the data set.

Problem 3 Using uppercase letters (A B C D E F G H, etc.), record the correct choice in the table below.

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |
| 11 |  |
| 12 |  |
| 13 |  |
| 14 |  |
| 15 |  |
| 16 |  |
| 17 |  |
| 18 |  |
| 19 |  |
| 20 |  |
|  |  |
|  |  |

1. According to the course PowerPoint lectures, in which decade did Lean Six Sigma become widespread?
2. 1980’s
3. 1990’s
4. 2000’s
5. 2010’s
6. According to the course PowerPoint lectures, in which decade did Crosby publish Quality Without Tears ?
7. 1940’s
8. 1960’s
9. 2000’s
10. 1980’s
11. Which of the following is one of the four Cost of Quality categories?
12. Assessment
13. Appraisal
14. Defects
15. Preparation
16. According to the lecture, in which decade did Six Sigma become widespread?
17. 1980’s
18. 1990’s
19. 2000’s
20. 2010’s
21. According to the lecture, in which decade did Quality Certification for managers become expected?
22. 1980’s
23. 1990’s
24. 2000’s
25. 2010’s

6. According to the course Power Point lecture, failure costs occurring after delivery or shipment of the product are classified as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Internal failures
2. External failures
3. Unnecessary failures
4. Unacceptable failures

7. \_\_\_\_\_\_\_\_\_\_\_\_\_ is the quality guru who emphasized top management’s responsibility for quality.

1. Juran
2. Deming
3. Romig
4. Taguchi

8. The “A” in PDSA represents \_\_\_\_.

1. Assess
2. Appraise
3. Act
4. Analyze

9. \_\_\_\_\_\_\_\_\_\_\_\_\_ is credited with developing the concept of cause and effect diagrams.

1. Ishikawa
2. Dodge and Romig
3. Juran
4. Shewhart

10. \_\_\_Who is credited with developing the quality trilogy?

1. Ishikawa
2. Feigenbaum
3. Juran
4. Taguchi

11. Who wrote Total Quality Control?

1. Ishikawa
2. Feigenbaum
3. Juran
4. Shewhart

12. In the course Power Point lectures, the costs associated with measuring, evaluating, or auditing products or services to assure conformance to quality standards and performance requirements are identified as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ costs.

1. Assurance
2. Assessment
3. Auditing
4. Appraisal

13. According to the course Power Point lectures, rework and retesting are examples of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ failure.

1. Internal
2. Inspection
3. Costly
4. Catastrophic

14. According to the course Power Point lectures, who emphasized the organizational impact of quality?

1. Crosby
2. Feigenbaum
3. Juran
4. Shewhart

15. Which test statistic should be used when sigma is known and there are 10 items in a single sample hypothesis test data set?

1. F
2. T
3. Z
4. None of the above

16. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Loss Function combines cost, target, and variation into one metric.

1. Ishikawa
2. Taguchi
3. Juran
4. Shewhart

17. Quality improvement projects and supplier capability surveys are examples of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Cost of Quality?

1. Assessment
2. Awareness
3. Prevention
4. External

18. Which of the following is one of the Cost of Quality categories?

1. Prevention
2. Preparation
3. Awareness
4. Assessment

19. Who introduced the concept of assignable or chance causes of variation?

1. Ishikawa
2. Feigenbaum
3. Juran
4. Shewhart

20. Who wrote Managerial Breakthrough?

1. Deming
2. Feigenbaum
3. Juran
4. Shewhart

**This is the end of EXAM 2 questions. Place all pages of the Exam in the box in the back of the classroom. Do not describe/share any of the Exam questions with anyone before the professor discusses the solutions in class.**