|  |  |
| --- | --- |
| **NAME:** |  |

**MATH125: Unit 3 Individual Project Answer Form**

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| --- |
| 1. Apply the order of operations to solve discipline-specific problems involving probabilities and counting principles. 2. Calculate applications of mathematical problems involving probabilities. 3. Differentiate between the concepts of odds and probabilities, as well as permutations and combinations, and identify how they relate to one another. 4. Identify and choose viable likelihoods based on calculated probabilities. |

**Logic and Decision Making**

ALL questions below must be answered. **Show ALL step-by-step calculations, round all your final answers correctly, and include the units of measurement**. Upload this modified Answer Form to the Unit 3 Individual Project. Make sure that you submit your work in a modified MS Word document; handwritten work will not be accepted. If you need assistance, please contact your course instructor.

A proposed directed study MATH125 class comprising 25 students earned the following grades on the first unit:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **MATH125** | **Total** | **Percentage** | **Unit 1** | **U1DB2** | **U1DB** | **U1i** | **U1IP** |
| **Class** | **Letter** | **Grade** | **Points** | **Points** | **Points** | **Points** | **Points** |
| **Names** | **Grade** | **Total (100)** | **Total (200)** | **Total (50)** | **Total (10)** | **Total (50)** | **Total (90)** |
| **Student #1** | B- | 82% | 163 | 48 | 10 | 50 | 55 |
| **Student #2** | C- | 72% | 144 | 34 | 0 | 40 | 70 |
| **Student #3** | C | 74% | 148 | 40 | 10 | 43 | 55 |
| **Student #4** | A | 93% | 186 | 50 | 10 | 36 | 90 |
| **Student #5** | B+ | 87% | 174 | 48 | 10 | 46 | 70 |
| **Student #6** | F | 56% | 112 | 44 | 5 | 28 | 35 |
| **Student #7** | B | 84% | 168 | 50 | 10 | 43 | 65 |
| **Student #8** | B- | 80% | 159 | 46 | 10 | 48 | 55 |
| **Student #9** | C+ | 79% | 158 | 50 | 10 | 73 | 25 |
| **Student #10** | B | 86% | 172 | 33 | 5 | 44 | 90 |
| **Student #11** | B- | 80% | 159 | 34 | 10 | 50 | 65 |
| **Student #12** | C+ | 77% | 154 | 40 | 5 | 44 | 65 |
| **Student #13** | A- | 90% | 179 | 36 | 10 | 43 | 90 |
| **Student #14** | C | 73% | 145 | 42 | 10 | 38 | 55 |
| **Student #15** | D | 66% | 131 | 28 | 0 | 33 | 70 |
| **Student #16** | B+ | 87% | 174 | 34 | 10 | 50 | 80 |
| **Student #17** | C+ | 79% | 158 | 30 | 0 | 43 | 85 |
| **Student #18** | B- | 80% | 159 | 46 | 10 | 38 | 65 |
| **Student #19** | C+ | 78% | 155 | 22 | 10 | 33 | 90 |
| **Student #20** | D | 61% | 121 | 28 | 10 | 38 | 45 |
| **Student #21** | B- | 80% | 159 | 34 | 10 | 50 | 65 |
| **Student #22** | B+ | 88% | 175 | 40 | 10 | 50 | 75 |
| **Student #23** | B | 85% | 169 | 41 | 0 | 43 | 85 |
| **Student #24** | B- | 80% | 160 | 22 | 10 | 48 | 80 |
| **Student #25** | C | 74% | 148 | 50 | 10 | 33 | 55 |

1. Calculate the class average for Unit 1. Using the “Grading Scale” listed below with the “Percentage Grade Total” above, what is the overall class average “Letter Grade”?

|  |  |  |  |
| --- | --- | --- | --- |
| **Grading Scale** | |  |  |
| **Letter Grade** | **Percentage** | **Letter Grade** | **Percentage** |
| A | 93–100 | C+ | 77–79.99 |
| A- | 90–92.99 | C | 73–76.99 |
| B+ | 87–89.99 | C- | 70–72.99 |
| B | 83–86.99 | D+ | 67–69.99 |
| B- | 80–82.99 | D | 60–66.99 |

|  |  |  |
| --- | --- | --- |
|  | **Class Average** | **Letter Grade** |
| **Unit 1** | **?** | **?** |

Show your work here: **(5 points)**

1. Create a frequency table to show the distribution of grades across the grading scale for the first week. **(5 points)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Letter Grade** | **Percentage** | **Frequency #** | **Cumulative Frequency #** |
| A | 93–100 | **?** | **?** |
| A- | 90–92.9 | **?** | **?** |
| B+ | 87–89.9 | **?** | **?** |
| B | 83–86.9 | **?** | **?** |
| B- | 80–82.9 | **?** | **?** |
| C+ | 77–79.9 | **?** | **?** |
| C | 73–76.9 | **?** | **?** |
| C- | 70–72.9 | **?** | **?** |
| D+ | 67–69.9 | **?** | **?** |
| D | 60–66.9 | **?** | **?** |
| F | Below 59.9 | **?** | **?** |

1. **Describe what you see based on the frequency distribution. (5 points)**
2. **Calculate the mean, median, and mode for the class’s first unit “Percentage Grade Total” grades.**

|  |  |
| --- | --- |
|  | **Answers**  **(Rounded to the nearest percent)** |
| **Mean** | **?** |
| **Median** | **?** |
| **Mode** | **?** |

Show your work here: **(15 points)**

1. Use the formulas for range, population variance, and population standard deviation with the “Percentage GradeTotal” to complete the following table. Make sure to check your answers with MS Excel. Also, round your answers to four decimal values.

|  |  |
| --- | --- |
|  | **Answers** |
| **Range** | **?** |
| **Variance** | **?** |
| **Standard deviation** | **?** |

Show your work here: **(15 points)**

1. At AIU, the following hypothetical propositions, *p* and *q*, are typically found to be true:

*p*: I redo my previous unit’s intellipath nodes.

*q*: I improve my overall score.

Write out the conditional statement as a symbolic sentence.

|  |  |
| --- | --- |
| **English Sentence** | **Symbolic Sentence** |
| **If I redo my previous unit’s Intellipath nodes, then I improve my overall score.** | **?** |

Write out the conditional statement as a symbolic sentence.

|  |  |
| --- | --- |
| **English Sentence** | **Symbolic Sentence** |
| **If my overall score did not improve, then I did not redo my previous unit’s intellipath nodes.** | **?** |

Are these two symbolic sentences logically equivalent? Why, or why not? **(15 points)**

1. The following hypothetical propositions, *p* and *q*, pertain strictly to Student #12 only.

*p*: They score 70 points on the Unit 5 Individual Project.

*q*: They will earn an 80% grade in the class.

Write out the conditional statement *p* → *q* as an English sentence.

|  |  |
| --- | --- |
| **Symbolic Sentence** | **English Sentence** |
| ***p* → *q*** | **?** |

Write out the conditional statement q → p as an English sentence.

|  |  |
| --- | --- |
| **Symbolic Sentence** | **English Sentence** |
| ***q* → *p*** | **?** |

Are these two English sentences logically equivalent? Why, or why not? **(15 points)**

1. Fill out the following truth table to determine the possible outcomes for the compound statement ~ *q* **∨** *p*. **(15 points)**

|  |  |  |  |
| --- | --- | --- | --- |
| ***p*** | ***q*** | ***~ q*** | ***~ q* ∨ *p*** |
| **T** | **T** | **?** | **?** |
| **T** | **F** | **?** | **?** |
| **F** | **T** | **?** | **?** |
| **F** | **F** | **?** | **?** |

Is this compound statement a tautology (T), fallacy (F), or neither?