※ 注意：請於試卷內之「非選擇題作答區」作答，並應註明作答之題號。

A. Multiple question: select the best answer (70%, 7% for each)

1. If the weatherwoman states that there is a 40% probability of rain on Sunday, 40% on Monday, and also 40% on Tuesday, what is the probability of **no** rain during these three days?
   A. 6.4%　　　B. 9.6%　　　C. 21.6%　　　D. 40%

2. An ecologist tested for toxin levels in water samples and found a mean of 98 and a standard deviation of 13. If toxin levels are normally distributed, then 95% of the samples have levels between
   A. 59 and 137　　　　　B. 81.3 and 114.7
   C. 72.5 and 123.5　　　D. 76.6 and 119.4

3. What is the interquartile range of this set of numbers?
   {9, 8, 9, 11, 15, 14, 8, 11, 12, 12}
   A. 1.5　　　B. 2　　　C. 2.5　　　D. 3

4. The frequency distribution table represents the distribution of grades on a certain biostatistics test. What is the mean grade?

Grade	Frequency
50-59	2
60-69	3
70-79	6
80-89	7
90-99	4

   A. 68.3　　　B. 74.5　　　C. 77.6　　　D. 78.1

5. A sample of 10 numbers has a standard deviation of 8.0. If those same numbers were a population, what would the population standard deviation be?
   A. 6.6　　　B. 7.6　　　C. 8.6　　　D. 9.6

6. Ages of students (x) and their grades (y) on a test are represented below. The Pearson product moment correlation coefficient is -0.975. If the **outlier** is removed, what is the new correlation coefficient?

x_i	18	19	22	47	19	23	21	20
y_i	78	82	83	41	81	79	79	80

   A. -0.125　　　B. -0.228　　　C. 0.228　　　D. 0.125

7. From a sample of 100 scores, the confidence interval for the mean calculated at 95% confidence interval is between 19.02 and 20.98. What is the **product** of the sample mean and standard deviation?
   A. 8　　　B. 10　　　C. 12　　　D. 15

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8. A simple linear regression line that has y = 0.5 x + 2.0.　What is the coefficient of determination of the regression relationship?

　　A. 0.1　　　　B. 0.25　　　　C. 0.5　　　　D. 2.0

9. A researcher randomly selected samples from a bird population to test the hypothesis that the three male phenotypes are present in equal frequencies in the population. Below are the data:

Male phenotype	Observed frequency	Expected frequency
Orange-throat	12	17
Blue-throat	30	17
Yellow-throat	9	17

What is the chi-square (x^2) test statistics?

　　A. 5.17　　　　B. 10.17　　　　C. 15.17　　　　D. 20.17

10. What is the degree of freedom in Question 9?

　　A. 1　　　　B. 2　　　　C. 3　　　　D. 4

B. Explain the following terms (30%, 6% for each)

1. Analysis of variance
2. Standard error
3. Nonparametric statistics
4. Type II error
5. Correlation coefficient

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