1. The Fahrenheit temperature readings would most likely be categorized as what level of data?
   a. ordinal  b. ratio  c. interval  d. nominal

2. The average starting salary for graduates at a university is $25,000 with a standard deviation of $2,000. How many of the graduates would have a starting salary between $21,000 and $29,000?
   a. at least 75%  b. at least 89%  c. at least 68%  d. at least 95%

3. In its Industry Norms and Key Business Ratios, Dun & Bradstreet reported that Q1, Q2, and Q3 for 2,037 gasoline service stations' sales to inventory ratios were 20.8, 33.4, and 53.8, respectively. From this we can conclude that
   a. 68% of these service stations had sales to inventory ratios of 20.8 or less
   b. 50% of these service stations had sales to inventory ratios of 33.4 or less
   c. 50% of these service stations had sales to inventory ratios of 53.8 or more
   d. 95% of these service stations had sales to inventory ratios of 20.8 or more

4. With ______ random sampling, there is homogeneity within a subgroup or stratum.
   a. judgmental  b. simple  c. cluster  d. stratified

(5–7) The following table provides summary information about students in a class. The sex of each individual and the major is given.

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>12</td>
<td>18</td>
<td>30</td>
</tr>
<tr>
<td>Finance</td>
<td>10</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>Other</td>
<td>26</td>
<td>26</td>
<td>52</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48</strong></td>
<td><strong>52</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

5. A student is randomly selected from this group, and it is found that the student is majoring in finance. What is the probability that the student is a male?
   a. 0.21  b. 0.10  c. 0.56  d. 0.48

6. A student is randomly selected from this group, and it is found that the student is a male. What is the probability that the student is majoring in accounting?
   a. 0.30  b. 0.40  c. 0.12  d. 0.25
7. A student is randomly selected from this group. Let A be the event that the student is an accounting major and let F be the event that the student is female. Are A and F independent and why or why not?
   a. yes, because there are some male accounting majors
   b. no, because there are some male accounting majors
   c. no, because P(A|F) does not equal P(A)
   d. no, because P(A|F) does not equal P(F)

8. If X has a binomial distribution with \( p > .5 \), then the distribution of X is ________.
   a. skewed to the right.
   b. skewed to the left.
   c. symmetric.
   d. a normal distribution.

9. The probability of a student randomly guessing the answers to 25 multiple choice questions is best modeled with the ________.
   a. binomial distribution
   b. hypergeometric distribution
   c. Poisson distribution
   d. hyperbinomial distribution

10. The number of people arriving at a bank in a 15 minute time interval is best modeled using the ________.
    a. binomial distribution
    b. hypergeometric distribution
    c. Poisson distribution
    d. hyperbinomial distribution

11. Suppose you are working with a data set that is normally distributed with a mean of 400 and a standard deviation of 20. Determine the value of X such that 5\% of the values are less than X.
    a. 432.9
    b. 396
    c. 367.1
    d. 404

12. Let X be a binomial random variable with \( n = 20 \) and \( p = .8 \). If we use the normal distribution to approximate probabilities for this, a correction for continuity should be made. To find the probability of more than 6 but less than 12 successes, we should find ________.
    a. \( P(6 < X < 12) \)
    b. \( P(6.5 < X < 12.5) \)
    c. \( P(6.5 < X < 11.5) \)
    d. \( P(5.5 < X < 12.5) \)

13. If arrivals at a bank follow a Poisson distribution, then the time between arrivals would be ________.
    a. normally distributed
    b. exponentially distributed
    c. a binomial distribution
    d. equal to lambda

14. Autocorrelation in a regression forecasting model be detected by the ________.
    a. F test
    b. Mann-Whitney test
    c. Durbin-Watson test
    d. Kruskal-Wallis test
15. A null hypothesis was rejected at the 0.10 level of significance. If the level of significance were changed to 0.05 and the same sample results were obtained, what decision should be made?
   a. reject the null hypothesis  
   b. do not reject the null hypothesis  
   c. cannot be determined without further information  
   d. all of the above

16. A null hypothesis was accepted at the 0.10 level of significance. If the level of significance was changed to 0.05 and the same sample results were obtained, what decision should be made?
   a. reject the null hypothesis  
   b. do not reject the null hypothesis  
   c. cannot be determined without further information  
   d. all of the above

17. In testing a hypothesis about two population means, if the t distribution is used, we must assume ______.
   a. the sample sizes are equal  
   b. the population means are the same  
   c. the standard deviations are not the same  
   d. both populations are normally distributed

18. The level of significance is selected to be 0.10. If the alternative hypothesis is that the average difference is greater than zero, the null hypothesis would be rejected if the calculated value of t is ______.
   a. greater than 1.533  
   b. less than -1.533  
   c. greater than 2.132  
   d. less than -2.132

19. Which of the following is NOT an aggregate measure of forecast error?
   a. MPC  
   b. MAD  
   c. MSE  
   d. MPE

20. A chi-square goodness-of-fit test is to be used to determine if a distribution is normally distributed. The data will be divided into "k" categories. Both the mean and standard deviation must be estimated. The degrees of freedom would be ______.
   a. k-1  
   b. k-2  
   c. k-3  
   d. k-4

第二部份：簡答題（每題 4 分，共 40 分）

(1-5) Richard Davis, a cost accountant at Chaoyang Plastics, Inc. (PPI), is analyzing the manufacturing costs of a molded plastic telephone handset produced by PPI. Richard’s independent variable is production lot size (in 1,000's of units), and his dependent variable is the total cost of the lot (in $100's). Regression analysis of the data yielded the following tables.
1. What is Richard's sample size?
2. What is the determinant coefficient?
3. Using $\alpha = 0.05$ to test $H_0 : \beta = 0.4$.
4. For a lot size of 10,000 handsets, what is the predict value of total cost?
5. Let $Y^* = 100 \cdot Y$ and $X^* = 1000 \cdot X$, and $\hat{\beta}_1^*$ is the slope of regression model for the transformed data $(Y^*, X^*)$. Compute $\hat{\beta}_1^*$ and compare with $\hat{\beta}_1$.
6. If $\rho_{Y,X} = 0$, does it mean that $X$ is of no use in predicting $Y$?
7. Which of the following regression functions are nonlinear?
   a. $Y_i = \beta_0 + \beta_1 X_i + \epsilon_i$
   b. $Y_i = \beta_0 + \beta_1 e^{X_i} + \epsilon_i$
   c. $Y_i = \beta_0 + \sin(\beta_1 X_i) + \epsilon_i$
   d. $Y_i = \beta_0 + \beta_1 X + \epsilon_i$
   e. $Y_i = \beta_0 + \sqrt{\beta_1} X_i + \epsilon_i$

$$Y_1 \sim N(\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \begin{bmatrix} 4 & 1 & 0 \\ 1 & 2 & 1 \\ 0 & 1 & 3 \end{bmatrix})$$

8. What is the joint distribution of $Y_1$ and $Y_2$?
9. What is the distribution of $2Y_1 + 3Y_2 + 4Y_3$?
10. What is the joint distribution of $Y_i$ and $\bar{Y} = (Y_1 + Y_2 + Y_3)/3$?