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You have 40 questions. You have 120 minutes to solve the exam. Please mark all your answers on the answer sheet provided to you. Make sure that the answer sheet form matches the question form. You have to submit both question paper and answer sheet but **only answer sheets will be graded.** Good luck

**Choose the best answer for each of the following questions:**

1. In the relationship between the number of studying hours and an exam grade, the number of studying hours is assumed to be  
A) continuous variable B) dependent variable C) nominal variable D) independent variable
2. The score on an IQ test is an example of which level of measurement  
A) nominal B) ordinal C) interval D) ratio
3. Nationality represents a  
A) continuous variable B) quantitative variable C) discrete variable D) qualitative variable
4. Nursing Supervisors are selected using random numbers in order to determine annual salaries. This is an example of  
A) random sampling B) systematic sampling C) cluster sampling D) stratified sampling
5. The average life expectancy in New Zealand is 78.49 years. This statement is an example of a (an) ..... statistics  
A) inferential B) qualitative C) descriptive D) quantitative
6. In a frequency distribution, if the relative frequencies are 0.20, 0.28,  $X$  and 0.16, then the relative frequency  $X$  is  
A) 0.63 B) 0.36 C) 0.46 D) 0.64
7. The data set that is collected over a period of time can be best represented by a (an) ...  
A) time series graph B) histogram C) pie graph D) ogive
8. In a pie graph, if the blood type A represents  $\frac{9}{72}$  of the distribution, how many degrees would be needed to represent A?  
A)  $8^\circ$  B)  $9^\circ$  C)  $72^\circ$  D)  $45^\circ$

Use the following to answer questions 9-10:

The following table shows the distribution of the blood type for 32 students:

Classes	A	B	O	AB
Frequency	5	10	8	9

9. The mean value  
A) is B B) is 8 C) is 2 D) cannot be calculated

10. The mode value  
A) is AB B) is 10 C) is B D) cannot be calculated
11. If the value  $X=6$  has a z-score of  $-0.50$  in a data set, then the mean  
A) is 5.50 B) is 6.00 C) is 6.50 D) cannot be determined from the given data
12. Which measures are mostly affected by outliers?  
A) Mean and mode B) Mode and midrange C) Mean and midrange D) Mean and median
13. Which one of the following is referred to as a statistic?  
A) The sample mode B) The sample data C) The population mean D) The population data
14. A negative relationship between two variables means that for the most part, as the X variable increases, the Y variable  
A) decreases B) increases C) equals X D) remains the same

Use the following to answer questions 15-16:

In the study of relationship between the number of absences  $X$  and the final grade  $Y$  of 6 students in the statistic class, the data are shown as follows

$$\sum X = 42, \sum Y = 470, \sum XY = 3143, \sum X^2 = 354 \text{ and } \sum Y^2 = 37358$$

15. The correlation coefficient is  
A) 0.82 B) 0.92 C) -0.82 D) 1
16. The slope of the regression line is  
A) 2.45 B) -3.45 C) 3.45 D) -2.45
17. The probability that a student has a computer is 0.91 and the probability that he has a car is 0.49 while the probability that he has either a computer or a car is 0.94. Find the probability that the student has both.  
A) 0.46 B) 0.05 C) 0.84 D) 0.43
18. Determine the number of all possible outcomes of guessing the last two digits in a telephone number if repetition of digits is allowed.  
A) 30 B) 100 C) 1000 D) 20
19. A committee of 4 people is to be formed from 6 doctors and 8 engineers. Find the probability that the committee will consist of at least two doctors.  
A) 0.83 B) 0.17 C) 0.41 D) 0.59
20. If the Spearman rank correlation coefficient ( $r_s$ ) equals 0.6, then the relationship can be described as  
A) positive, strong and non linear C) positive, moderate and linear  
B) weak and linear D) moderate and non linear
21. How many different ways can 4 tickets be selected from 10 tickets if each ticket wins a different prize?  
A) 270 B) 720 C) 5040 D) 120

Use the following to answer questions 22-23:

The table below shows the number of earned degrees in the year 2008 in a university by level and gender. A person who earned a degree in the year 2008 from this university is randomly selected. Find the probability of selecting someone who

		Male	Female
Level of Degree	Bachelor's	300	200
	Master's	35	15

22. earned a master's degree or is a female  
 A) 0.7 B) 0.45 C) 0.64 D) 0.48
23. is a female given that the person earned a bachelor's degree.  
 A) 0.4 B) 0.67 C) 0.36 D) 0.6
24. A box contains 3 red balls and 5 black balls. 4 balls are selected with replacement. The standard deviation of the number of red balls that will be obtained is  
 A) 0.938 B) 5 C) 4 D) 0.968
25. A die is rolled 5 times. the probability of getting a number 4 one time only is  
 A) 0.402 B) 0.167 C) 0.015 D) 0.386
26. If  $X$  is a discrete random variable with  $\sum [X^2 P(X)] = 6$  and  $E(X) = 2$ . The variance for the probability distribution of  $X$  is  
 A) 1.732 B) 2 C) 4 D) 1.141
27. The outcomes of each trial in a binomial experiment  
 A) are unlimited B) are independent C) are dependent D) must be fixed

Use the following to answer questions 28-29:

Two dice are rolled. Let  $X$  represents the summation of the two faces that will appear.

		Die 1					
		Sums	1	2	3	4	5
Die 2	1	2	3	4	5	6	7
	2	3	4	5	6	7	8
	3	4	5	6	7	8	9
	4	5	6	7	8	9	10
	5	6	7	8	9	10	11
	6	7	8	9	10	11	12

28. The probability of  $X=4$  is  
 A) 0.083 B) 0.833 C) 0 D) 0.028
29. The probability of  $X=15$  is  
 A) 0.056 B) 0.028 C) 0.083 D) 0

30. When the distribution is **positively skewed**, the relationship of the mean, median, and mode from left to right will be
- A) Mean, median, mode  
 B) Mode, median, mean  
 C) Median, mode, mean  
 D) Mean, mode, median

Use the following to answer questions 31-33:

The time  $T_1$  to travel from A to B through city center (road  $R_1$ ) is normally distributed with mean 20 minutes and standard deviation 5 minutes.

The time  $T_2$  to travel from A to B through a new ring road (road  $R_2$ ) is normally distributed with mean 15 minutes and standard deviation 8 minutes.

You have 17 minutes to travel from A to B on an important appointment. Using this information, solve the following

31.  $P(T_1 > 17)$   
 A) 0.2743 B) 0.7257 C) 0.2257 D) 0.7743
32.  $P(T_2 > 17)$   
 A) 0.5987 B) 0.0987 C) 0.4013 D) 0.9013
33. Your correct decision is  
 A)  $R_2$  is better than  $R_1$   
 B)  $R_1$  is better than  $R_2$   
 C) Both  $R_1$  and  $R_2$  are the same  
 D)  $R_2$  is not as good as  $R_1$

Use the following to answer questions 34-35:

The monthly income,  $X$ , of a family in a given city is normally distributed with mean \$3000 and standard deviation \$500.

34. The probability that a person selected at random earns a monthly income between \$2500 and \$3500  
 A) 0.3413 B) 0.6826 C) 0.1587 D) 0.3174
35. If a random sample of size 9 is selected at random, find the probability that the mean income of the sample is between \$2500 and \$3500  
 A) 0.0013 B) 0.4987 C) 0.9974 D) 0.5601

Use the following to answer questions 36-37:

Let  $X$  be a normally distributed random variable with mean 100 and a standard deviation 10. Use this information to find the value of  $a$  such that

36.  $P(X > a) = 0.0427$   
 A) 101.72 B) 17.2 C) 117.2 D) 82.8
37.  $P(95 < X < a) = 0.6309$   
 A) 115.5 B) 101.5 C) 84.5 D) 15.5
38. Find the value of  $z$  such that the shaded tail areas equals 0.10



- A) 1.64 B) 1.28 C) -1.96 D) 0.25

39. "A distribution using the means computed from all possible random samples of a specific size taken from a population." The previous statement is the definition of  
A) central limit theorem B) sampling distribution C) sampling error D) empirical distribution
40. Approximately what percentage of normally distributed data values will fall within 1 standard deviation above or below the mean.  
A) 68% B) 95% C) 99.7% D) 13.5%