KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2019

Marks Scored:

Level: B. Sc.
Year : II

Course : STAT 201
Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date : FEB 18 2019

SECTION "A"
[10 Q. × 1 =10 marks]

Fill in the blank space(s) by the most appropriate word(s) or symbol(s).

1. About the independent events A and B it is known that P(A|B) = 0.2 and P(B|A) = 0.5. Then P(A ∪ B)=.....

2. The covariance of two independent random variable is.....

3. If $\Sigma P(x) = k^2 - 8$ then, the value of k is.....

4. The table below gives the preference of male and female for tissues with or without essential oil.

Preference	Males	Females	Total
With essential oils added	23	64	87
Without essential oils added	35	42	77
Total	58	106	164

From this table, the probability of a male using tissue with essential oil is : .....

5. From the above table the probability of female not using essential oil is .....

6. From the table in Question no 4, given that a tissue with essential oil is bought then the probability that it is used by a woman is .....

7. Two random variables X and Y have the regression lines 2x + y = 13 and 3x + 2y = 21 then μ_x and μ_y are .....

8. Find the correlation coefficient for the previous problem.....

9. Estimate of X when Y=1 for problem 7 is .....

10. The regression equations of two random variables, X and Y, are

$x - \frac{5}{4}y + \frac{33}{5} = 0$ and $y - \frac{20}{9}x + \frac{107}{9} = 0$. The standard deviation of X is 3. Then the standard deviation of Y is .....

SECTION "B"

[10 Q. × 1 = 10 marks]

Choose and encircle the most appropriate answer from the given options.

11. A scatter plot.....
    a. shows how Y and X are related when their relationship is scattered all over the place.
    b. relates the covariance of X and Y to the correlation coefficient.
    c. is a plot of n observations on Xi and Yi , where each observation is represented by the point (X_i, Y_i)
    d. shows n observations of Y over time

12. The slope of the regression/prediction line (using the least squares criterion) is .....
    a. always equal to the correlation coefficient
    b. equal to the correlation coefficient if r = 1
    c. equal to the correlation coefficient if the x and y variables are in standardized form
    d. not related to the correlation coefficient

13. Suppose you have the following information about the CDF of a random variable X, which takes one of 4 possible values: Value of

X	1	2	3	4
CDF	0.25	0.4	0.8	1

Which of the following is/are true?.....

a. Pr(X = 2) = 0.4 b. E(X) = 2.55 c. Pr(X = 4) = 0.2 d. all of the above

14. If two random variables X and Y are independent, then .....
    a. their joint distribution equals the product of their marginal distributions
    b. the conditional distribution of X given Y equals the marginal distribution of X
    c. their covariance is zero
    d. a, b, and c

15. The expected value of probability distribution is .....
    a. the measure of the spread of the distribution
    b. the variance of the distribution
    c. the average value of the distribution
    d. the probability density function

16. The conditional expectation of Y given X, $E(Y \mid X = x)$, is calculated as follows:
    a. $\sum_{i=1}^{k} y_i \Pr(X = x_i \mid Y = y)$.
    b. $E[E(Y \mid X)]$.
    c. $\sum_{i=1}^{k} y_i \Pr(Y = y_i \mid X = x)$.
    d. $\sum_{i=1}^{J} E(Y \mid X = x_i) \Pr(X = x_i)$.

17. Let X represent the amount of time it takes a student to find a parking space in the parking lot at a university. We know that the distribution of X can be modeled using an exponential distribution with a mean of 4 minutes. What is the probability that it takes a randomly selected student between 2 and 8 minutes to find a parking space in the parking lot?

a. 0.557 b. 0.524 c. 0.471 d. 0.233

18. The joint probability distribution of X and Y is given by $f(x, y) = (x+y)/21$, $x= 1, 2, 3$ and $y=1, 2$. The conditional of $Y = 1$ given $X = 1$ is .....

a. 2/5 b. 3/5 c. 4/5 d. 1/5

19. With respect to problem no 18, the conditional of $Y = 1$ given $X = 3$ is.....

a. 4/9 b. 5/9 c. 4/5 d. 1/5

20. In a study of the growth of rabbits in controlled surroundings, the weight of the rabbits was measured (dependent variable). The independent variable would most likely be:

a. rainfall
b. music played to the rabbits
c. the amount of food fed to the rabbits
d. the size of the enclosure