BRAINWARE UNIVERSITY

Term End Examination 2020 - 21

Programme – Bachelor of Technology in Computer Science & Engineering

Course Name – Probability and Statistics

Course Code - BSC(CSE)301

Semester / Year - Semester III

Time allotted : 75 Minutes | Full Marks : 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 60=60

1. *(Answer any Sixty)*

(i) The first moment about means is always:

a) Zero
b) 1
c) Negative
d) None of these

(ii) In descriptive statistics, we study

a) The description of decision making process
b) The methods for organizing, displaying, and describing data
c) How to describe the probability distribution
d) None of these

(iii) In regression analysis, the variable that is being predicted is the

a) response, or dependent, variable
b) independent variable
c) intervening variable
d) is usually x

(iv) The coefficient of correlation

a) is the square of the coefficient of determination
b) is the square root of the coefficient of determination
c) a. is the same as r-square
d) a. is the same as r-square

(v) Which of the following divides a group of datainto four subgroups?

a) Percentiles
b) Standard Deviation

c) Median
d) Quartiles

(vi) The slope of the regression line of Y on X is known as

a) Correlation Coefficient of X on Y
b) Correlation Coefficient of Y on X
c) Regression Coefficient of X on Y
d) Regression Coefficient of Y on X

(vii) The value of the correlation coefficient (r) should be

a) >1
b) <1
c) $-1<r<1$
d) None of these

(viii) Minimum value in class limit is called

a) Primary limit
b) upper limit
c) lower limit
d) secondary limit

(ix) Questionnaire survey method is used to collect

a) Secondary data
b) Qualitative variable
c) Primary data
d) None of these

(x) The Mode of the following data is : 2,1,3,2,1,5,2,2,1,6,4,21,3

a) 5
b) 2
c) 3
d) 1

(xi) Relation between A.M, G.M and H.M

a) A.M>G.M>H.M
b) A.M=G.M=H.M
c) A.M<G.M<H.M
d) None of these

(xii) The distribution for which mean and variance are equal is

a) Poisson
b) Normal
c) Binomial
d) Exponential

(xiii) How many outcomes are possible if 3 new employees are to be selected from a group of 5 applicants?

a) 10 b) 12

c) 15 d) 30

(xiv) The mean of the binomial distribution is

a) less than the variance b) equal to its variance

c) greater than its variance d) greater than or equal to its variance

(xv) A set of all possible outcomes of an experiment is called

a) Combination b) Sample point

c) Sample space d) Compound event

(xvi) Standard deviation is calculated from the Harmonic Mean (HM)

a) Always b) Sometimes

c) Never d) None of these

(xvii) The variance of 5 numbers is 10. If each number is divided by 2, then the variance of new numbers is

a) 0 b) 20

c) 5 d) 2.5

(xviii) The _____ sum of squares measures the variability of the sample treatment means around the overall mean.

a) treatment b) error

c) interaction d) total

(xix) The error deviations within the SSE statistic measure distances:

a) within groups b) between groups

c) both (a) and (b) d) none of these

(xx) If F-DATA = 5, the result is statistically significant

a) Always
b) Sometimes
c) Never
d) not possible to conclude

(xxi) You obtained a significant test statistic when comparing three treatments in a one-way ANOVA. In words, how would you interpret the alternative hypothesis HA?

a) All three treatments have different effects on the mean response.
b) Exactly two of the three treatments have the same effect on the mean response.
c) At least two treatments are different from each other in terms of their effect on the mean response.
d) None of these

(xxii) Which of the following statistical concepts is used to test differences in the means for more than two independent populations?

a) regression analysis
b) multiple analysis
c) ANOVA
d) none of these

(xxiii) Which of the following ANOVA components are not additive?

a) Sum of square
b) mean sum of square
c) degrees of freedom
d) all of these are additive

(xxiv) A Type I error occurs when we:y

a) reject null hypothesis when it is true
b) reject alternative hypothesis when it is true
c) accept null hypothesis when it is false
d) accept alternative hypothesis when it is false

(xxv) For testing of hypothesis critical region is also known as

a) confidence region
b) acceptance region
c) rejection region
d) none of these

(xxvi) The chance of rejecting of a true hypothesis decreases when sample size is

a) increases
b) decreases
c) constant
d) both (a) and (b)

(xxvii) Largest value is 60 and smallest value is 40 and number of classes desired is 5 then class interval is

a) 20
b) 4
c) 25
d) 15

(xxviii)

For Mesokurtic curve of the distribution, β_2 is

a) 0
b) <3
c) >3
d) =3

(xxix)

If r=0.6, b_{yx}=1.2 then b_{xy}=?

a) 0.3
b) 0.2
c) 0.72
d) 0.40

(xxx)

The condition for mutually exclusive of two events A and B is

a) $P(A \cup B) = P(A) + P(B)$

b) $P(A+B) = P(A)P(B)$

c)

d) $P(A \cap B) = P(A)P(B/A)$

$P(A-B)=P(A)P(B)$

(xxxi)

The value of Var(aX) is , where 'a' is constant and 'X' is a random variable

a) aVar(X)

b) a^2Var(X)

c) Var(X)

d) A

(xxxii)

If $P(A)=\frac{1}{3}$, $P(B)=\frac{1}{4}$, $P(A\cup B)=\frac{1}{2}$, then $P(B/A)$ is

a) $\frac{3}{4}$

b) $\frac{4}{3}$

c) $\frac{1}{4}$

d) $\frac{1}{3}$

(xxxiii)

If $P(A)=\frac{1}{2}$, $P(B)=\frac{1}{3}$ and $P(A\cap B)=\frac{1}{4}$, then the value of $P(A\cup B)=$

a)

b)

$\frac{6}{7}$

$\frac{3}{7}$

c) 1

d)

$\frac{7}{12}$

(xxxiv)

The probability $P(a \le X \le b)$ (where F(x) is the distribution function of the random variable X) is defined by

a) F(b)-F(a)

b) F(b) F(a)

c) F(a)-F(b)

d) F(b)+F(a)

(xxxv)

The mean of the Binomial distribution $B\left(10, \frac{2}{5}\right)$

a) 4

b) 6

c) 5

d) 0

(xxxvi)

The probability of any event A satisfies

a)

$\overline{P(A) \ge 1}$

b)

$P(A) < 0$

c)

$0 \le P(A) \le 1$

d)

None of these

(xxxvii)

Two even A and B are mutually exclusive if

a) $P(A \cup B)=P(A)P(B)$

b) $P(A \cap B)=P(A)P(B)$

c) $P(A \cap B)=0$

d) None of these

(xxxviii)

If $P(A)=0.2, P(B)=0.4, P(A \cup B)=0.6$ then A and B are

a) mutually exclusive

b) independent

c) exhaustive

d) complement of each other

(xxxix)

Then the probability of obtaining a 'six' is

a) $\frac{1}{6}$

b) $\frac{1}{3}$

c)

d) none of these.

$\frac{1}{2}$

(xl)

Three coins are tossed at random. Then the probability that there will be at least one head is

a) $\frac{3}{8}$

b) $\frac{7}{8}$

c) $\frac{2}{9}$

d) $\frac{5}{8}$

(xli)

The probability of throwing an even number with an ordinary six faced die is

a) $\frac{1}{2}$

b) $\frac{1}{4}$

c) $\frac{2}{5}$

d) none of these

(xlii)

Two unbiased coins are tossed. Then the probability of obtaining at least one tail is

a)

b)

a) $\frac{3}{4}$

b) $\frac{1}{2}$

c) $\frac{1}{4}$

d) none of these.

(xliii)

One card is drawn from a pack of 52 cards. The probability which is either king or queen is

a) $\frac{1}{13}$

b) $\frac{3}{13}$

c) $\frac{2}{13}$

d) $\frac{4}{13}$

(xliv)

A bag contains five red and four black balls. Two balls are drawn at random. The probability that they are both red is

a) $\frac{2}{9}$

b) $\frac{4}{9}$

c) $\frac{5}{9}$

d) $\frac{7}{9}$

(xlv)

The probability that a leap year selected at random will contain 53 Sundays is

a) $\frac{2}{7}$

b) $\frac{3}{7}$

c) $\frac{4}{7}$

d) $\frac{5}{7}$

(xlvi)

Two perfect coins are tossed simultaneously, the probability of getting at least one head is

a) $\frac{1}{2}$

b) $\frac{1}{4}$

c) $\frac{3}{4}$

d) 1

(xlvii)

In rolling two fair die, the probability of getting equal numbers or numbers with an even product is

a) $\frac{5}{6}$

b) $\frac{1}{6}$

c) $\frac{3}{4}$

d) $\frac{3}{6}$

(xlviii)

One number is selected at random from 1 to 100. The probability that it is a perfect square is

a) b) 1/10

c) 1 d) $\frac{1}{7}$

$\frac{3}{7}$

(xlix)

A card is drawn at random from a well-shuffled pack of cards. The probability that it is heart or queen is

a) b) $\frac{5}{13}$

$\frac{4}{13}$

c) d) $\frac{9}{13}$

$\frac{7}{13}$

(l)

If $P(X=x)=\frac{x}{21}$ for $x=1,2,\ldots,6$ $=0$, elsewhere, then $P(X=2 \text{ or } 3)$ is

a) b) $\frac{3}{21}$

$\frac{2}{21}$

c) $\frac{4}{21}$

d) $^{5}/_{21}$

(li)

A random variable X has the following p.d.f $f(x)=\frac{1}{4}, \quad -2<x<2$ $=0, \quad \text{elsewhere}$, then P(2X+3>5) is

a) 1

b) $\frac{1}{2}$

c) $\frac{1}{4}$

d) $\frac{3}{4}$

(lii)

The mean of Binomial distribution B(n,p) (where n and p are the number of trials and probability of success) is

a) $\frac{n}{p}$

b) 0

c) np

d) 1

(liii)

If X is normally distributed with zero mean and unit variance, then expectation of X^2 is

a) 1

b) 2

c) 8

d) 0

(liv)

Var(2X+3)=?

a)

2Var(X)

b)

4Var(X)

c)

2Var(X)+3

d)

None of these

(lv)

The expected value of the sample variance of size n drawn from a population with mean μ and standard deviation σ is

a)

σ^2

b)

$n\sigma^2$

c)

$\frac{n-1}{n}\sigma^2$

d)

$\frac{\sigma^2}{n}$

(lvi)

The maximum likelihood estimate is a solution of the equation

a)

$$\frac{\partial L(\theta)}{\partial \theta} = 0$$

b)

$$\frac{\partial L(\theta)}{\partial \theta} = \text{constant}$$

c)

d) None of these

$$\frac{\partial L(\theta)}{\partial \theta} = \theta$$

(lvii)

If $H_1(\mu < 60)$ be an alternative hypothesis, then the Null hypothesis is

a)

$H_0(\mu < 60)$

b)

$\overline{H_0(\mu \geq 60)}$

c)

$H_0(\mu \leq 60)$

d)

$H_0(\mu = 60)$

(lviii)

Test the hypothesis $H_0 : \mu = 20$ alternate $H_0 : \mu < 20$ leads to

a)

right one-tailed test

b)

left one-tailed test

c)

two sided test

d)

all of these

(lix)

In hypothesis testing P(Type I Error)=?

a)

$1-\alpha$

b)

α

c) $\overline{1-\beta}$

d) β

(lx)

For the test statistic $t = \frac{x-\mu}{\sigma/\sqrt{n}}$ has degrees of freedom

a) 1

b) n

c) n-1

d) 0