

MODEL ANSWER

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SEMESTER END THEORY EXAMINATION
B.Sc. (Hons.) Agriculture

Semester	:	III	Term	:	I	Academic Year	:	2021-22
Course No.	:	STAT-231	Title	:	Statistical Methods			
Credits	:	2(1+1)						
Day and Date	:	24.11.2021	Time	:	1.00 Hour	Total Marks	:	40

Note: 1) Solve ANY FOUR questions from SECTION-A
2) Solve ANY SIX questions from SECTION-B
3) ALL questions from SECTION - C are compulsory
4) Send the PDF file of answer sheet to the email id of respective course teacher

SECTION-A

(Write the answers in 4-5 sentences only. Each question carries 4 marks)

Q.1) State the four merits of Arithmetic Mean.

Ans: Merits of Arithmetic Mean:

- 1) It is rigidly defined.
- 2) Easy to understand and easy to calculate.
- 3) It is based on hundred percent observations.
- 4) It is amenable to algebraic treatment.

Q.2) Define Statistics and state any two limitations of statistics.

Ans: Definition: Statistics is concerned with Scientific methods for collecting, organizing, summarizing, presenting and analyzing data as well as deriving valid conclusions and making reasonable decisions on the basis of analysis.

Limitations of Statistics:

- 1) Statistics does not study individuals.
- 2) Statistics is not suitable to be study of qualitative phenomenon.

Q.3) Write the characteristics of a good measure of dispersion

Ans: Characteristics of a good measure of dispersion are:

- 1) It should be rigidly defined.
- 2) It should be based on all the items.
- 3) It should not be unduly affected by extreme observations.
- 4) It should be simple to understand and easy to calculate.

Q.4) Write the four properties of correlation coefficient.

Ans: The following properties of correlation coefficient as –

- 1) The correlation coefficient r values ranges between -1 to +1.
- 2) Correlation coefficient is independent of change of origin and scale.
- 3) If $r = +1$ then the correlation is perfect positive and $r = -1$ then the correlation is perfect negative.
- 4) Two independent variables are uncorrelated.

Q.5) State the properties of Binomial Distribution.

Ans: Properties of Binomial Distribution:

- 1) The shape and location of Binomial distribution changes as p changes for a given 'n'.
- 2) The mode of Binomial distribution is equal to the value of x which has largest probability.
- 3) The mean and mode are equal if mean = np is an integer.

For a fixed n, both mean and mode increases as p increases

SECTION-B

(Write the answers in 1 sentence only. Each question carries 2 marks)

Q.6)

a) Define Standard Deviation.

Ans: The positive square root of the arithmetic mean of the square of the deviations of the given observations from their arithmetic mean is called 'Standard Deviation'.

b) Give formula of test statistics for Paired-t test.

Ans: $t = \frac{\bar{d} - \mu_d}{s_d / \sqrt{n}}$

c) Define Type-II Error.

Ans: Accepting the null hypothesis H_0 when it is false is called Type – II Error.

d) Calculate the probability of getting two heads in tossing of two unbiased coins

Ans: Sample Space (S) = { HT, TH, HH, TT }, $n(S) = 4$,

Therefore, the probability of getting two heads in tossing of two unbiased coins = $\frac{1}{4}$.

e) Define Simple Hypothesis.

Ans: If the statistical hypothesis completely specifies the distribution, it is called simple hypothesis.

f) State the four types of classification of Statistical data

Ans: Types of Classification: 1) Chronological classification 2) Qualitative classification 3) Geographical classification 4) Quantitative classification

g) Define degrees of freedom.

Ans: The number of independent variates (observations) which make up the test statistic is known as its degrees of freedom.

SECTION-C			
	(Choose the correct option. Each question carry 1 mark)		
Q.7	1) The probability of the entire sample space is -----.		
	a) 1	b) -1	
	c) 0	d) ∞	
	2) Population census is an example of -----.		
	a) Simple Random Sampling	b) Stratified Sampling	
	c) Complete Enumeration	d) None of these	
	3) Sample is said to be of small size if -----.		
	a) $n < 30$	b) $n > 30$	
	c) $n = 30$	d) $n = 0$	
	4) Median of a series 10,4,8,6,2,12,3 is		
	a) 12	b) 6	
	c) 1	d) 2	
	5) ----- is affected most by extreme observations.		
	a) Arithmetic Mean	b) Median	
	c) Mode	d) Harmonic Mean	
	6) The square of standard normal variate is called -----.		
	a) Binomial variate	b) Poisson variate	
	c) F - variate	d) Chi – Square variate	
	7) If A and B are two independent events, then multiplication theorem of probability says that		
	a) $P(A \cup B) = P(A) \times P(B)$	b) $P(A \cup B) = P(A) + P(B)$	
	c) $P(A \cap B) = P(A) \times P(B/A)$	d) $P(A \cap B) = P(A) \times P(B)$	
	8) Limits for correlation coefficient are -----.		
	a) -2 to +2	b) -3 to +3	
	c) -1 to +1	d) $-\infty$ to $+\infty$	

9) For which distribution mean and variance are equal.			
a)	Normal	b)	Binomial
c)	Poisson	d)	None of these
10) The average of the upper and lower limit of a class is known as -----.			
a)	Quartile	b)	Range
c)	Mid-values	d)	Tally marks
11) Which of the following is a one-dimensional diagram.			
a)	Simple Bar diagram	b)	Multiple Bar diagram
c)	Percentage Bar diagram	d)	All of the above
12) If the coefficient of skewness $\beta_1 = 0$, then the distribution is -----.			
a)	Positively skewed	b)	Leptokurtic
c)	Symmetric	d)	Mesokurtic
