Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Agriculture

End Sem Examination Dec 2024

AG3CO23 Statistical Methods

Programme: B.Sc. (Hons.) Branch/Specialisation: Agriculture

Duration: 3 Hrs. **Maximum Marks: 50**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	PO	CO	PSO
Q.1	i.	Which of the following is the value that occurs most frequently in a dataset? (a) Median (b) Mean (c) Mode (d) Standard deviation	**1**	1	1	1	
	ii.	Which of the following is a measure of dispersion? (a) Mode (b) Mean (c) Range (d) Frequency	**1**	1	1	1	
	iii.	What is the probability of getting a head when a fair coin is tossed? (a) 0 (b) 1/2 (c) 1 (d) 2	**1**	2	1	2	
	iv.	The Poisson distribution is used when- (a) Events occur in fixed time intervals (b) Events occur randomly but at a constant average rate (c) Events are dependent on each other (d) Events have more than two outcomes	**1**	2	1	2	
	v.	What is the primary purpose of correlation in statistics? (a) To establish a causal relationship (b) To measure the strength and direction of a relationship between two variables (c) To predict one variable from another (d) To measure data dispersion	**1**	2	1	3	

P.T.O.

	vi.	What is the range of values for Karl Pearson's coefficient of correlation? (a) -10 to 10 (b) -1 to 1 (c) 0 to infinity (d) 0 to 1	**1**	1	1	3
	vii.	The null hypothesis for chi-square test of independence states that- (a) The attributes are dependent (b) The attributes are independent (c) The attributes are correlated (d) None of these	**1**	2	1	4
	viii.	In a One-Way ANOVA, if there are four groups being compared, the degrees of freedom for 'between groups' is- (a) 4 (b) 3 (c) 2 (d) 1	**1**	2	1	4
	ix.	What is the main purpose of sampling in statistics? (a) To observe every member of a population (b) To gather information about a population by examining a subset (c) To improve data collection accuracy (d) To avoid any form of data analysis	**1**	2	1	5
	x.	What is complete enumeration also known as? (a) Sampling (b) Population survey (c) Census (d) Sample survey	**1**	1	1	5
Q.2	i.	Define Statistics.	**1**		1	
	ii.	What is data? Give examples.	**2**	1	1	1
	iii.	Describe in detail application of statistical methods in agriculture.	**5**	2	1	1
OR	iv.	Enlist different ways of graphical representation of data. Discuss few measures of central tendency and dispersion.	**5**	2	1	1
Q.3	i.	Define probability.	**1**	1	1	2
	ii.	What is addition and multiplication theorem?	**3**	1	1	2
	iii.	Describe binomial distribution. Explain with examples.	**4**	2	1	2
OR	iv.	Describe Poisson distribution. Explain with examples.	**4**	2	1	2

Q.4	i.	Define correlation and explain its significance in statistical analysis.	**2**	3	1	3
	ii.	Describe Karl Pearson's coefficient of correlation and its calculation.	**6**	3	1	3
OR	iii.	What are the possible values of Pearson's correlation coefficient? What do they represent?	**6**	3	1	3
Q.5	i.	Explain the Chi-Square test of independence.	**2**	2	1	4
	ii.	What is the purpose of analysis of variance (ANOVA)? How does it differ from t-tests?	**2**	2	1	4
	iii.	Discuss the assumptions underlying ANOVA. Describe the steps in conducting an ANOVA test.	**4**	2	1	4
OR	iv.	How do you set up a 2×2 contingency table for a Chi-Square test of independence? Provide an example.	**4**	4	1	4
Q.6		Attempt any two:				
	i.	Describe different types of sampling methods and provide examples of when each method is most appropriate.	**4**	4	1	5
	ii.	Compare and contrast sampling with complete enumeration (census). Explain the advantages and disadvantages of each approach and when each would be more appropriate.	**4**	4	2	5
	iii.	Under what conditions is a census preferable to sampling? Discuss scenarios or research types where a complete enumeration is necessary.	**4**	4	2	5

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Marking Scheme
AG3CO23 Statistical Methods

Q.1	i)	b) Mode	**1**
	ii)	c) Range	**1**
	iii)	b) 1/2	**1**
	iv)	b) Events occur randomly but at a constant average rate	**1**
	v)	b) To measure the strength and direction of a relationship between two variables	**1**
	vi)	b) -1 to 1	**1**
	vii)	b) The attributes are independent	**1**
	viii)	b) 3	**1**
	ix)	b) To gather information about a population by examining a subset	**1**
	x)	c) Census	**1**
Q.2	i.	Definition of Statistics.	**1**
	ii.	Definition of Data. (1 marks) Examples. (1 marks)	**2**
	iii.	Different methods of statistical methods in agriculture. (2 marks) Describe in detail application of statistical methods in agriculture. (3 marks)	**5**
OR	iv.	Enlist different ways of graphical representation of data. (2 marks) Discuss few measures of central tendency and dispersion. (3 marks)	**5**
Q.3	i.	Define probability.	**1**
	ii.	Define addition. (1.5 marks) Define multiplication theorem. (1.5 marks)	**3**
	iii.	Describe binomial distribution. (2 marks) Explain with examples. (2 marks)	**4**
OR	iv.	Describe Poisson distribution. (2 marks) Explain with examples. (2 marks)	**4**
Q.4	i.	Define correlation. (1 marks) Explain its significance in statistical analysis. (1 marks)	**2**
	ii.	Describe Karl Pearson's coefficient of correlation (3 marks) Calculation. (3 marks)	**6**
OR	iii.	What are the possible values of Pearson's correlation coefficient (4 marks) what do they represent? (2 marks)	**6**
Q.5	i.	Explain the Chi-Square Test of Independence.	**2**
	ii.	What is the purpose of Analysis of Variance (ANOVA marks), and how does it differ from t-tests?	**2**
	iii.	Discuss the assumptions underlying ANOVA. Describe the steps in conducting an ANOVA test.	**4**
OR	iv.	How do you set up a 2×2 contingency table for a Chi-Square Test of Independence? Provide an example.	**4**
Q.6			
	i.	Describe different types of sampling methods. (2 marks) Provide examples of when each method is most appropriate. (2 marks)	**4**
	ii.	Compare and contrast sampling with complete enumeration (census marks). (2 marks) Explain the advantages and disadvantages of each approach and when each would be more appropriate. (2 marks).	**4**
	iii.	Under what conditions is a census preferable to sampling? (2 marks) Discuss scenarios or research types where a complete enumeration is necessary. (2 marks)	**4**

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