S.Y.B.Sc. STATISTICS Paper-2 Semester-4

Solution QP Code : S27708

Q.1	**(a)**	**State True or False and correct if necessary:**	
	1	False. - Means of more than two populations are compared using Analysis of variance technique.	**(2)**
	2	True	**(2)**
	3	False. In Completely Randomized Design (CRD), all treatments need not be replicated same number of times.	**(2)**
	4	False. A 4×4 Latin square design (LSD) will have error degrees of freedom 6.	**(2)**
	5	False. Levels of more than one factor can be compared in factorial experiments.	**(2)**
	(b)	**Answer the following questions:**	
	1	Layout -2 mks	**(2)**
	2	Any two assumptions.	**(2)**
	3	Any two advantages.	**(2)**
	4	The formula for estimated efficiency of Latin square design relative to Completely Randomized design. -2 mks	**(2)**
	5	[B] = [ab] + [b] – [a] – [1] [AB] = [ab] - [b] – [a] + [1]	**(2)**
Q.2		**Attempt any two sub questions:**	
	(a)	Explanation - 2 mks Splitting of Total SS – 4 mks E[BCSS] – 4 mks	**(10)**
	(b)	Least Square Estimators - 4 mks Hypotheses - 2 mks Distribution of S. S. due to factor A / σ^2 – 4 mks.	**(10)**
	(c)	Derivation – 3+3+2 mks Hypothesis -2 mks	**(10)**
Q.3		**Attempt any two sub questions:**	
	(a)	Explanation – 3 mks E[Error SS] – 7 mks	**(10)**

Q 2

	(b)	State principles – 2 mks Principles – 2+2+2 mks Use -1+1 mks	**(10)**
	(c)	Least Square Estimators - 4 mks E[Treatment SS] – 3 mks Advantages and disadvantages of RBD - 3 mks	**(10)**
Q.4		**Attempt any two sub questions:**	
	(a)	Describe – 2 mks E[Error SS] – 4 mks ANOVA table – 4 mks	**(10)**
	(b)	Discuss the case of missing observation – 3 mks Describe the procedure to analyze the data when one observation is missing in Randomized Block Design – 7 mks	**(10)**
	(c)	Define efficiency of one design over another design – 2 mks Obtain expression for efficiency of Latin Square Design over Randomized Block Design when columns are treated as blocks – 8 mks	**(10)**
Q.5		Attempt any two sub questions:	
	(a)	Show that mean error sum of squares is an unbiased estimator of σ^2 for analysis of variance one way classification.- 4 mks Formulae for calculation – 3 mks ANOVA table – 3 mks	(10)
	(b)	Explain the terms : 2 mks each	**(10)**
	(c)	Describe factorial experiments – 3 mks Describe Yates procedure to obtain various factorial effect totals in 2^3-Factorial experiments – 7 mks	**(10)**

****