

**M. SC. (APPLIED STATISTICS)
(MSCAST)**

Term-End Examination

June, 2026

**MST-019 : EPIDEMIOLOGY AND
CLINICAL TRIALS**

Time : 2 Hours

Maximum Marks : 25

Note : (i) *Question no. 1 is compulsory.*

(ii) *Attempt any **two** questions from the remaining question nos. 2 to 4.*

(iii) *Non-programmable scientific calculator is allowed.*

(iv) *Symbols have their usual meanings.*

1. (a) Which one of the following is the target period for screening a disease ?

(i) Total pre-clinical phase

(ii) Clinical phase

- (iii) From the biological onset of a disease to point in time when a disease can be detected by the screening test.
- (b) In the definition of epidemiology 'distribution' refers to (choose all which are correct) :
- (i) When
 - (ii) Where
 - (iii) Who
 - (iv) Why
- (c) The statement : "An active control is the one that works in a large percentage of cases" is true or false, give reason why ?
- (d) What is regimen in clinical trials ?
Explain with examples. 1+1+1+2
2. Explain Equivalence, Superiority and Non-inferiority trials in detail. 4+3+3
3. (a) If the odds of males in a study is 0.40 then find the proportion of males in the study.

- (b) Results of a study of 5,000 participants with a follow-up period of 15-years and outcome of interest CHD are given as follows :

	Cases of CHD	Person-times (in years)
Smokers	600	40800
Non-smokers	300	27600
Total	900	68400

Answer the following :

- (i) What is the incidence rate of CHD among smokers ?
- (ii) What is the incidence rate of CHD among all participants ?
- (c) Write flow chart of Epidemiological studies. 2+4+4
4. (a) Computerized Axial Tomography (CAT) test is applied to 200 cases of brain tumour and 80,000 healthy persons

having no brain tumour at all. The results of the test are shown as follows.

		Brain tumour status		Total
		Present (D ⁺)	Absent (D ⁻)	
Result of CAT test	T ⁺	195	4000	4195
	T ⁻	5	76000	76005
Total		200	80000	80200

What are the Sensitivity and Specificity of the CAT test ? Also, interpret the result.

- (b) Ten patients of kidney disease were randomly allocated to receive two methods of dialysis. 5 patients received dialysis-A followed by dialysis-B and the other 5 received dialysis-B followed

by dialysis A. Their kidney function scores were as follows :

Group-I AB Sequence						
Subject No.		1	2	3	4	5
Period-I	Dialysis A	67	73	50	69	75
Period-II	Dialysis B	66	79	68	72	84

Group-II BA Sequence						
Subject No.		6	7	8	9	10
Period-I	Dialysis B	59	68	74	71	70
Period-II	Dialysis A	53	69	52	63	65

Assume there is no carry-over effect.
 Test whether the mean score for
 dialysis A is significantly different from
 the mean of dialysis B. 4+6

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