

No. of Printed Pages : 3

**MST-019**

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

**Term-End Examination**

**June, 2024**

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

*Time : 2 Hours*

*Maximum Marks : 25*

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

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

(iii) *Use of scientific calculator (non-programmable) is allowed.*

(iv) *Symbols have their usual meanings.*

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1. (a) In the definition of epidemiology, explain the meaning of word 'Person'.
- (b) The number of live births in 2010 in a rural area was 3752. The number of infant deaths during the same year was 505. Find infant mortality rate for 2010.
- (c) In clinical trials what is the meaning and role of 'Placebo'. 2+1+2

**P. T. O.**

2. (a) Dexamethasone Suppression Test (DST) is applied on 290 persons with depression and 205 healthy persons having no depression. The results of the test are shown as follows :

	Depression Status			
		Yes (D <sup>+</sup> )	No (D <sup>-</sup> )	Total
Result of DST	T <sup>+</sup>	110	5	115
	T <sup>-</sup>	180	200	380
	Total	290	205	

What are the sensitivity and specificity of the test ? Also determine the positive and negative predictive values of the test. Also, give interpretation of the results obtained.

- (b) Suppose it is known that an established diagnostic test for typhoid provides correct diagnosis in 62% subjects. Another diagnostic test is devised and tried on 30 subjects for non-inferiority. This provided correct diagnosis in 21 subjects. Can we conclude that the new diagnostic test is not inferior to the established diagnostic test ? The non-inferiority margin may be assumed as 1% (Given  $Z_{0.01} = 1.645$ ). 6+4

**[ 3 ]**

3. For a cohort study, explain each of the following in detail : 4+3+3
- (i) Design of cohort study
  - (ii) Analysis of data of cohort study design
  - (iii) Advantages and disadvantages of cohort study design.
4. Explain each phase of clinical trials in detail. 10