

M. Sc. EPIDEMIOLOGY
SEMESTER - II EXAMINATION, JUNE - 2026

(CMEP506) CAUSATION IN EPIDEMIOLOGY, DISEASE PREVENTION AND SCREENING

[Time Allotted: 3:00 Hours]

[Max. Marks: 100]

Note: Read all the instructions carefully

Answer all questions in serial order, Draw suitable diagrams wherever necessary

Q. 1. Objective type questions: (Attempt All)

(10 x 02 = 20)

(Very short/ Short answer/ MCQ/ One liners/ Fill in the blanks/ True/False)

- a. What does the concept of association in epidemiology refers to? (CO -1, PO - 1)
 - i. The relationship between two variables
 - ii. The causation of diseases
 - iii. The prevention of diseases
 - iv. The treatment of diseases
- b. Cause-effect relationship in epidemiology is best established by: (CO -1, PO - 1)
 - i. Observational studies
 - ii. Randomized Controlled trials
 - iii. Case studies
 - iv. Ecological studies
- c. The ADVANCED triangle of Epidemiology includes: (CO -1, PO - 1)
 - i. Agent, host, environment
 - ii. Agent, vector, environment
 - iii. Agent, host, vector
 - iv. Host, vector, pathogen
- d. Which of the following is an example of primary prevention? (CO - 2, PO - 1)
 - i. Regular screenings for breast cancer
 - ii. Vaccination against measles
 - iii. Chemotherapy for lung cancer
 - iv. Rehabilitation programs for stroke patients
- e. Screening tests aim to: (CO - 3, PO - 1)
 - i. Cure diseases
 - ii. Diagnose diseases at an early stage
 - iii. Treat diseases
 - iv. Prevent diseases entirely
- f. Positive predictive value is: (CO -3, PO - 1)
 - i. The proportion of positive tests that are true positives.
 - ii. The proportion of negative tests results that are true negatives.
 - iii. The likelihood that a negative is truly negative.
 - iv. The accuracy of the test in all cases
- g. Which of the following factors influences the positive predictive value of a screening test? (CO -3, PO - 1)
 - i. Sensitivity
 - ii. Specificity
 - iii. Prevalence of the disease in the population
 - iv. Both i and ii
- h. The lead time gained from early detection in screening refers to: (CO -3, PO - 1)
 - i. The time between diagnosis and treatment
 - ii. The time between the onset of disease and diagnosis
 - iii. The time between treatment and recovery
 - iv. The time between recovery and relapse
- i. Which of the following is NOT a potential harm associated with screening programs? (CO -3, PO - 4)
 - i. Overdiagnosis
 - ii. False positives
 - iii. Increased anxiety
 - iv. Decreased disease incidence
- j. Which of the following best describes causation in epidemiology? (CO - 1, PO - 1)
 - i. A factor that always leads to a disease
 - ii. A factor that increases the probability of a disease occurring
 - iii. A factor that is associated with a disease but may not directly cause it
 - iv. A factor that is irrelevant to the occurrence of a disease

Q. 2. Short notes / Short Answer Type (Attempt any five out of seven)

(5 × 4 = 20)

- a. Negative predictive value (CO - 1, PO - 1)
- b. Herd Immunity (CO - 2, PO -1)
- c. Intra observer variation (CO - 3, PO - 1)
- d. Paradox prevention (CO - 1, PO -1)
- e. Prospective screening (CO - 1, PO -1)
- f. Positive Likelihood ratio (CO - 3, PO - 1)
- g. Lead Time (CO - 3, PO - 1)

Q. 3. Structured Question (Attempt any three out of four)

(3 × 10 = 30)

- a.** Explain the concept of biological plausibility in assessing causation in epidemiology. Provide examples of how biological mechanisms support causal relationships. (CO – 1, PO - 1)
- b.** What role does confounding play in determining causation in epidemiology? How can researchers control for confounding factors? (CO – 1, PO - 1)
- c.** Define disease prevention and its importance in public health. Describe levels of prevention with the help of table. (CO – 2, PO - 1)
- d.** Describe in detail ROC curve with suitable example. (CO – 3, PO -2,4,5)

Q. 4. Long Answer/Essay type (Attempt any two out of three)

(2 × 15 = 30)

- a.** Explain the concept of causation in epidemiology and discuss the criteria that must be considered when establishing a causal relationship between an exposure and disease (CO – 1, PO -1)
- b.** Explain the concept of sensitivity and specificity in the context of screening tests. How do these measures influence the accuracy of screening programs? (CO – 3, PO - 4)
- c.** Describe Wilson's criteria for disease screening. Give differences between screening and diagnostic tests. (CO – 3, PO – 1,2,4)