

[LL 1017]

OCTOBER 2017

Sub. Code: 2862

M.Sc. BIOSTATISTICS EXAMS
FIRST YEAR
(New Regulation)
PAPER II – EPIDEMIOLOGY AND DESIGN OF EXPERIMENTS

Q.P. Code : 282862

Time : Three hours

Maximum : 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. How does the choice of an imperfect gold standard bias the results from a diagnostic study? Discuss in what direction would it affect the sensitivity and specificity?
2. A medical education researcher wants to design an experiment to explore the effectiveness of three teaching interventions to improve learning among medical students. The three interventions are group based learning, problem based learning and case based learning. The researcher wants the design to allow testing of individual as well as combined effects of teaching interventions. Discuss how many groups can be incorporated in the study and explain the choice of a suitable statistical design and steps in testing the effects of teaching interventions in detail.

II. Write notes on:

(10 x 6 = 60)

1. Using a relevant example explain the components of an epidemiological triad and describe how its component interact in causing disease.
2. A study on early treatment of breast cancer compared patients who had a biopsy early in their clinical course to patients biopsied later in their course. The study measured time to recurrence of breast cancer and found that those biopsied earlier had a longer time to recurrence. Name and explain the bias likely to account for this finding.
3. In clinical trials, continuous outcomes such as body mass index are measured both before and after treatment. While randomization allows for comparison between groups, imbalances might occur due to chance, particularly with small sample sizes. Write a detailed statistical analysis plan on how such data will be analyzed.
4. What is Linkage Disequilibrium Coefficient? And how is it used to map a gene?
5. Explain the role of path analysis in quantitative genetic epidemiology with an example?
6. Discuss the common models of genetic inheritance and how such models can be incorporated in statistical analysis.
7. Discuss experimental designs that utilize blocking as a principle to reduce residual error.
8. Explain how randomization process for the Completely Randomized Design (CRD) is different from the Randomized Block Design (RBD)?
9. Explain Likelihood ratio of diagnostic test.
10. Explain the role of primary demographic factors affecting population genetics.
