Reg. No.										

MANIPAL UNIVERSITY

FIRST YEAR (M.Sc. MLT / M.Sc. NMT (NR) / M.Sc. MIT) / SECOND SEMESTER M.Sc. HHIA DEGREE EXAMINATION – DECEMBER 2014

SUBJECT: BIOSTATISTICS/ PAPER IV – ADVANCED BIOSTATISTICS AND RESEARCH METHODOLOGY/ BIOSTATISTICS/EPIDEMIOLOGY & BIOSTATISTICS

Wednesday, December 17, 2014

Time: 10:00 – 13:00 Hrs. Max. Marks: 80

Answer ALL the questions.

1. List any two types of probability sampling? Describe any one of them in detail.

(1+4 = 5 marks)

2. Briefly explain various scales of measurement with suitable examples.

(5 marks)

3. Describe the concept of sampling distribution and standard error. In a study conducted on a sample of 1600 subjects, the prevalence of a particular condition was estimated to be 10%. Calculate 95% confidence interval for this estimate.

(5+5 = 10 marks)

4. Explain the rationale for and the concept of tests of significance. What are the steps involved in performing tests of significance.

(6+4 = 10 marks)

5. A team of cardiologists conducted a study to investigate the association between oral contraceptive use and hypertension. The results of the study are given below:

	Hypertensive	Normotensive	Total
Oral contraceptive	8	32	40
Other	15	45	60
Total	23	77	100

At 1% level of significance, do these data provide sufficient evidence to indicate the association between method of contraceptive use and hypertension? ($\chi^2_{1df}(0.01) = 6.64$)

(10 marks)

6. What are the requirements for calculating minimum sample size for estimating proportion and how they influence the required minimum sample size?

(5 marks)

7. Distinguish between:

7A. Case report and case series studies

7B. Correlational and other descriptive studies

7C. Incidence rate and prevalence rate

7D. Relative risk and odds ratio

7E. Retrospective and prospective study designs

(10 marks)

8. A cohort study was conducted to find the effect of oral contraceptive (OC) use on breast cancer. Ten thousand women free from breast cancer were selected for the study and followed up for 10 years. Forty out of 8000 non users of OC and 14 out of 2000 OC users developed breast cancer. Calculate appropriate measure of strength of association and interpret the same.

(5 marks)

9. Take a suitable example and explain the situation for the application of logistic regression.

(5 marks)

10. In order to assess the validity of a test, it was applied on 100 individuals with a disease and 100 without the disease. The test resulted in a positive diagnosis for 80 out of those with disease and 10 of those without disease. Construct appropriate 2×2 table and calculate sensitivity, specificity, positive predictive value and negative predictive value of the test.

(5 marks)

11. Explain the components of a scientific report.

(10 marks)