

Question Paper

Exam Date & Time: 10-Dec-2019 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST SEMESTER M.O.T./ M.Sc. M.L.T./ M. Opt./ M.Sc. R.T./ M.Sc. ECOCARDIOGRAPHY/M.Sc. CC&IT / M.Sc. H.I.M./
M.Sc. M.I.T./M.P.T./M.Sc. E.S.S./ M.Sc. N.M.T./ M.Sc. M.R.P./ M.Sc. RRT&DT/M.Sc. AUDIOLOGY/M.Sc. (S.L.P.)/M.Sc.
CLINICAL PSYCHOLOGY DEGREE EXAMINATION - DECEMBER 2019

SUBJECT: RES 601 - BIostatistics & RESEARCH METHODOLOGY/RESEARCH METHODOLOGY &
BIostatistics/ADVANCED BIostatistics & RESEARCH METHODOLOGY/RESEARCH METHODS, EPIDEMIOLOGY
& STATISTICS
(2018 SCHEME)

Tuesday, December 10, 2019 (14.00 - 17.00)

Marks: 100

Duration: 180 mins.

Answer all the questions.

- 1) The following data represent the blood cholesterol levels of 16 first-year students at a particular college. (8)
- 213 174 193 196 220 183 194 200 192 200 200 199 178 183 188
- Report the value of the range and interquartile range.
2. Differentiate between the following:
- 2A) Interval scale and ratio scale. (4)
- 2B) Stratified sampling and cluster sampling. (4)
- 2C) Parametric and non parametric tests. (4)
- 2D) Reference range and confidence interval. (4)
3. Describe with an example:
- 3A) The situation to apply multiple linear regression and its model. (4)
- 3B) Kappa statistic for agreement. (4)
- 4) Which are the errors that we come across while testing a hypothesis? Give examples. (4)
- 5) Explain the situation and assumptions to perform one way ANOVA. (4)
- 6) Illustrate the procedure of sample selection by systematic random sampling. Enumerate its advantages and limitations. (6)
- 7) List the contents of a research thesis. (5)
- 8) With the help of examples differentiate between clinical trials and observational studies. (10)

9) What is confounding? How is confounding adjusted in statistical analysis? (6)
(2+4 = 6 marks)

10) With the help of scatter diagrams describe the strength of positive correlation. (6)

11. It was observed that the incubation period in days of patients with infectious hepatitis follows normal distribution with a mean of 20 days and standard deviation of 4 days. What percentage of the patients have incubation period.

11A) Below 28 days (2)

11B) Between 20 and 24 days (2)

11C) Above 16 days (2)

12) List the required information to determine sample size for comparing two proportions. (4)

13. In a sample of 60 men who have had myocardial infarction, the mean CPK (Creatine Phosphokinase) level is $285 \mu / l$ and the standard deviation is $16 \mu / l$.

13A) What is the standard error of this mean? (1)

13B) Determine the margin of error for the above estimate. (3)

13C) Construct a 95% confidence interval for the population mean. (1)

14) A study has been planned to compare mean body mass index between diabetes and non-diabetes subjects. A minimum difference of 2 kg/m² is considered as clinically significant. What is the minimum number of subjects required in each group at 5% level of significance and 80% power if the pooled standard deviation is found to be 7 kg/m²? ($Z_{\alpha} = 1.96$, $Z_{\beta} = 0.84$) (4)

15) In a study of diabetes, the following results were obtained from samples of males and females above 35 years of age. (8)

	Number of participants	Number of diabetic cases
Males	100	46
Females	76	32

Can one conclude on the basis of this data that in the sampled populations there is a difference in proportions that are diabetic among males and females? (Let $\alpha = 0.05$)

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