Question Paper

Exam Date & Time: 13-Feb-2020 (02:00 PM - 05:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST SEMESTER M.O.T. / 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. CLINICAL PSYCHOLOGY DEGREE EXAMINATION - FEBRUARY 2020

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

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1) The CD4 T cell counts ($x10^6$ / l) at base line for 10 - HIV positive subjects are as follows: (8)

230 210 313 173 158 103 181 115 301 216

Calculate coefficient of variation.

2. Differentiate between the following:

2A) Interval scale and ratio scale. (4)

2B) Simple random sampling and convenience sampling. (4)

2C) Type I error and level of significance. (4)

2D) Standard deviation and standard error. (4)

3. Explain the following with an example:

3A) The situation to apply survival analysis and its model. (4)

3B) Kappa statistic for agreement. (4)

4) Elaborate the usage of non-parametric tests in comparison with parametric tests. (8)

5) Illustrate the procedure of sample selection by stratified random sampling. Enumerate its uses and limitations. (6)

6) List the contents of a research thesis. (5)

7) With the help of examples differentiate between clinical trials and observational studies. (10)

8) Elucidate the merits and limitations of using matching in a case control study design. (6)

9) A sample of 250 rheumatoid arthritis patients had been treated with a non-steroidal anti-inflammatory drug. Among them 172 patients were recovered from the disease. Construct 99% confidence interval for the proportion of recovered patients and interpret the result. [$Z_{1 - \alpha/2} = 2.58$] (5)

10)	A study was conducted to test the hypothesis that people with glaucoma have higher blood pressure than average. How many people with glaucoma are to be recruited to construct a 95% confidence interval for the true mean systolic blood pressure among people with glaucoma if we anticipate the standard deviation of systolic blood pressure to be 24 mmHg? Margin of error is fixed at 4 mmHg.	(4)
11)	Elucidate the required information to determine sample size for comparing two proportions.	(4)
12)	Interpret the terms slope and intercept used in linear regression (both simple and multiple). What does the term 'linear' refer to in linear regression?	(6)

13. A study on the fasting blood glucose levels of patients gave a mean of 156 mg/dl and a standard deviation of 12 mg/dl. Assuming normal distribution of the glucose levels, what proportion of these patients will have fasting blood glucose level.

13A)	Above 168 mg/dl	(2)
13B)	Less than 132 mg/dl	(2)
13C)	Between 144 mg/dl and 156 mg/dl	(2)

14)	A researcher conducted a study involving high-risk pregnancies. A sample of 35 nulliparous women delivered babies whose mean weight was 2900 grams with a standard deviation of 600. The mean and standard deviation of weights of babies born to a sample of 35 multiparous women were 3200 and 740, respectively. Test the null hypothesis that mean of the two populations are same at 5% level of significance and interpret your findings.	(8)

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