Question Paper

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. CARDIAC CATHETERIZATION & INTERVENTIONAL TECHNOLOGY/./ 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 2018

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

Monday, December 10, 2018 (10.00 - 13.00)

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

1)   The following are the arterial activated partial thromboplastin time values recorded from   (8)
         a group of 10 patients. Obtain the values of median and interquartile range.
         20.7   23.2   29.6   34.4   56.2   30.1   21.3   26.5   21.8   35.2

2) **Differentiate between the following:**

2A)   Quantitative and qualitative variables   (4)

2B)   Cluster sampling and stratified sampling   (4)

2C)   Type I error and type II error   (4)

2D)   Sampling distribution and standard error   (4)

3) **Explain the following with an example:**

3A)   The situation to use logistic regression and its model   (4)

3B)   Bland Altman plot   (4)

4)   When do we use non parametric tests? Explain Mann Whitney U test.   (8)

5)   Illustrate the procedure of selecting a sample using multistage sampling. Enumerate its (6)
         uses and limitations.

6)   Enumerate the contents of a research protocol.   (5)

7)   With the help of examples explain prevalence studies and ecological study designs.   (10)

8)   Describe methods to deal with confounder at analysis stage of an epidemiological study. (6)

9) **A certain drug was found to be effective in the treatment of pulmonary disease in 160 of 200 cases treated.**

9A)   What is the standard error of proportion?   (1)

9B)   Construct a 95% confidence interval for the population prevalence.   (3)

9C)   Determine the margin of error for the above estimate.   (1)

10)   List the factors that affect sample size required for a study.   (4)

11)   A study has been planned to compare mean body mass index between diabetes and   (4) non-diabetes subjects. A minimum difference of 2 kg/m^2 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/m^2? (Z_α = 1.96, Z_β = 0.84)

12)   Interpret the slope and intercept, given the regression equation is Y = 5 - 20X. What do   (6) the terms 'simple' and 'linear' refer to in simple linear regression? Define coefficient of determination.
(2+2+2 = 6 marks)

13) **It was observed that the incubation period in days of patients with infectious hepatitis follows normal distribution with a mean of 19 days and standard deviation of 5 days. What percentage of the patients have incubation period**

13A)   Below 4 days   (2)

13B)   Between 24 and 34 days   (2)

13C)   In the reference range   (2)

14)   Can we conclude that self confidence level of chronically ill children are, on the average   (8) different from that of healthy children? A test designed to measure self-confidence was administered to 35 chronically ill and 35 healthy children.[α = 0.05, $Z_{1-\alpha/2}$ = 1.96]. The mean scores and standard deviations were as follows:

	Mean	Standard Deviation
Ill group	22.5	4.1
Healthy group	26.9	3.2

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