

MANIPAL UNIVERSITY

**FRIST YEAR MASLP / MSc. MLT / MSc. NMT / MSc. MIT / SECOND SEMESTER M.Sc.
CLINICAL PSYCHOLOGY / MSc MRP / M.Sc. HHIA / MSc MIT DEGREE
EXAMINATION – DECEMBER 2016**

**SUBJECT: STATISTICS & RESEARCH METHODS (SH 101) / BIOSTATISTICS / ADVANCED
BIOSTATISTICS & RESEARCH METHODOLOGY (PAPER IV) / BIOSTATISTICS / ADVANCED
BIOSTATISTICS & RESEARCH METHODOLOGY (MCP 106) / RESEARCH METHODOLOGY &
BIOSTATISTICS / EPIDEMIOLOGY & BIOSTATISTICS (MHI 606) / BIOSTATISTICS (MIT 203)**

Thursday, December 15, 2016

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

☞ **Answer ALL the questions.**

1A. Define mean, median, mode, standard deviation and coefficient of variation.

1B. Define sample and sampling.

1C. What are the characteristics of a good sample?

(5+2+3 = 10 marks)

2A. Define sampling distribution and standard error.

2B. Explain the formula for 95% confidence interval for:

i) Mean

ii) Proportion

iii) Difference between two means

iv) Difference between two proportions

(2+ (2 marks × 4) = 10 marks)

3A. Explain the test used for comparing the mean of a variable before and after an intervention in a sample of individuals.

3B. In a survey, 246 urban school children and 349 rural school children were examined for conductive hearing loss. Out of 246 urban children, 36 suffered from conductive hearing loss while among rural school children 61 suffered with hearing loss. Test whether the proportion of hearing loss differs between urban and rural children at 5% level of significance. The table value is given as 3.84.

(5+5 = 10 marks)

4. Discuss with suitable examples:

i) ANOVA

ii) Repeated measures ANOVA

(5+5 = 10 marks)

5. Explain the design, analysis, merits and demerits of a randomized controlled trial.

(10 marks)

- 6A. Describe cross sectional study design with an example.
- 6B. A study has been planned to compare the mean hearing thresholds levels between urban and rural children. How many children are required in each group if an average difference of 4 decibels is considered as clinically important with 80% power and 1% level of significance? The standard deviation of hearing threshold level is expected to be 7 decibels. The table value for 80% power and 1% level of significance is 0.84 and 2.58 respectively.

(5+5 = 10 marks)

7. Explain the structure of a research protocol.

(10 marks)

8. **Write short notes on:**

- 8A. Reliability of a diagnostic test
- 8B. Systematic reviews and meta-analysis

(5+5 = 10 marks)



MANIPAL UNIVERSITY**FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – DECEMBER 2016****SUBJECT: IMMUNOLOGY AND IMMUNOLOGICAL TECHNIQUES**

Friday, December 16, 2016

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 70

- ✍ **Answer all the questions.**
✍ **Draw Diagrams if necessary.**

- 1A. Enumerate and describe neutrophil function tests.
1B. Define complements. Explain classical and alternative pathways of complement activation system. Add a note on complement receptors.
1C. Describe the maturation, activation and differentiation of T cells.

(10 marks × 3 = 30 marks)

2. Write briefly on:

- 2A. Antigens
2B. MHC molecules
2C. FACS
2D. B cell assays
2E. Nephelometry

(5 marks × 5 = 25 marks)

3. Write short notes on:

- 3A. Mixed lymphocyte culture
3B. Ig M
3C. ADCC
3D. Passive agglutination tests
3E. Direct ELISA

(3 marks × 5 = 15 marks)



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MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – DECEMBER 2016

SUBJECT: BIOMEDICAL TECHNIQUES

Saturday, December 17, 2016

Time: 10:00 – 11: 30 Hrs.

Maximum Marks: 40

✍ Answer ALL questions.

✍ Draw diagrams wherever necessary.

1. Discuss in detail about protein purification methods. Add a note on Gel filtration chromatography.

(10+5 = 15 marks)

2. Write detailed notes on:

2A. Malate aspartate shuttle and its significance in ETC

2B. Solubilizers used in gel electrophoresis

2C. PAGE

2D. Paper chromatography

2E. Atomic emission spectrophotometry

(5 marks × 5 = 25 marks)

