

# MANIPAL UNIVERSITY

MASTER OF PHYSIOTHERAPY (MPT) – PART I DEGREE EXAMINATION – MAY 2013

SUBJECT: RESEARCH METHODOLOGY

Tuesday, May 28, 2013

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 100

1. Define the following:

1A. Mean

1B. Median

1C. Mode

1D. Inter quartile range

1E. Coefficient of variation

(2×5 = 10 marks)

2. Explain systematic review and meta analysis.

(10 marks)

3. Distinguish between sampling and non-sampling errors. Explain simple random sampling.

(10 marks)

4A. Explain the factors that determine the sample size for estimating population proportion.

4B. You want to evaluate the use of creatine kinase (CK) as a diagnostic test for acute myocardial infarction (AMI). This test was drawn on 500 consecutive patients admitted to the intensive care unit with suspected AMI. A CK level of 80 IU was selected as normal. Each person was also diagnosed by a team of expert cardiologists who didn't know the results of the CK determination. The results are summarized below:

CK result	AMI	
	Present	Absent
Positive	275	50
Negative	25	150

(5+5 = 10 marks)

5A. Discuss Binomial and Poisson distributions with the help of examples.

5B. Give an example where repeated measures ANOVA is applied and enumerate the assumptions for this test.

(10+5 = 15 marks)

6A. Explain Chi square test of significance.

An epidemiologist conducts a case control study to examine the association between pesticide exposure and lung cancer. The results observed are given below.

Pesticide exposure	Lung cancer		Total
	yes	No	
Exposed	30	10	40
Not exposed	70	90	160
Total	100	100	200

6B. Test whether the above data provides any evidence of association between pesticide exposure and lung cancer at 5% level of significance. (Chi square at 1 df is 3.84)

6C. What is the strength of association between pesticide exposure and lung cancer and interpret it?

(5+5+5=15 marks)

7. With the help of an example explain how you conduct a randomized controlled trial.

(15 marks)

8. Write short notes on:

8A. Survival analysis.

8B. Mann-Whitney U test.

8C. Regression.

(5×3 = 15 marks)



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## MANIPAL UNIVERSITY

MASTER OF PHYSIOTHERAPY (MPT) – PART-I DEGREE EXAMINATION – MAY 2013

SUBJECT: THEORETICAL BASIS & PRINCIPLES OF PRACTICE IN PHYSIOTHERAPY

Thursday, May 30, 2013

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 100

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*✍* **Answer ALL questions. All questions carry equal marks.**

1. Describe the musculoskeletal changes following aging and its clinical implications.
2. Write in detail about the monitoring systems in ICU. What are the 'Universal Precaution' in ICU care?
3. Describe the biomechanics of throwing action.
4. Explain pain gate mechanism. Discuss how LASER reduces pain.
5. Explain the principles and method of Fitness evaluation.



**MANIPAL UNIVERSITY****MASTER OF PHYSIOTHERAPY (MPT) – PART I DEGREE EXAMINATION – DECEMBER 2013****SUBJECT: RESEARCH METHODOLOGY**

Wednesday, December 18, 2013

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 100

- 1A. Define rate, ratio and proportion with suitable examples to distinguish them from each other.  
1B. Describe in detail the rationale for and the concept of a sample study.  
(5+5 = 10 marks)
- 2A. Enumerate any four types of probability sampling methods and describe the lottery method for selecting a sample.  
2B. List the considerations in calculating minimum sample size for testing of difference in means of two groups and explain the influence of those considerations on the sample size.  
((2+3)+5 = 10 marks)
3. Enumerate the properties of normal curve. In a population, haemoglobin level was found to be normally distributed with a mean of 10 grams/dl and a standard deviation of 1 gram/dl. Calculate the proportion of persons in the population with their haemoglobin level  
i) more than 12 grams/dl    ii) less than 9 grams/dl    iii) between 9 and 12 grams/dl.  
(5+5 = 10 marks)
4. What do you mean by testing of hypothesis? What are the steps involved in testing of hypothesis?  
(2+8 = 10 marks)
5. Distinguish between:
- 5A. parametric and non-parametric tests  
5B. null and alternate hypothesis  
5C. two sided and one sided test  
5D. type I and type II error  
5E. level of significance and p-value  
(10 marks)
- 6A. A comparative study between extracapsular cataract extraction (ECCE) with posterior chamber intraocular lens (IOL) implantation and intracapsular cataract extraction (ICCE) with aphakic correction was done for the treatment of senile cataract. Two hundred cases were studied in each group. Success of surgery was defined as vision better than 6/18 after 6 months follow up. The results are summarized in the table below.

Type of treatment	Treatment success	Treatment failure	Total
ECCE with IOL	148	52	200
ICCE with aphakic glasses	138	62	200
Total	286	114	400

Test at 5% level of significance to see if there is any significant association between type of treatment and the outcome. ( $\chi^2_{1df}(0.05) = 3.84$ )

6B. Discuss the different types of correlation with the help of scatter diagrams. (5+5 = 10 marks)

7. What is a descriptive epidemiological study? Explain briefly the types of descriptive epidemiological study designs. (2+8 = 10 marks)

8A. What are the steps involved in the conduct of a randomized clinical trial?

8B. A case control study was conducted to assess the effect of smoking on myocardial infarction (MI). Three hundred thirty of 350 MI cases and 550 of 820 controls were smokers. Construct appropriate 2X2 table, calculate odds ratio and interpret the same. (5+5 = 10 marks)

9A. Distinguish between simple and multiple linear regression analyses.

9B. 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 X 2 table and calculate sensitivity, specificity, positive predictive value and negative predictive value of the test. (5+5 = 10 marks)

10. Explain the steps involved in a research protocol. (10 marks)



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## MANIPAL UNIVERSITY

### MASTER OF PHYSIOTHERAPY (MPT) – PART-I DEGREE EXAMINATION – DECEMBER 2013

SUBJECT: THEORETICAL BASIS & PRINCIPLES OF PRACTICE IN PHYSIOTHERAPY

Thursday, December 19, 2013

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 100

**Answer ALL questions. All questions carry equal marks.**

1. Write down the prosthetic option for a high below knee amputee. Discuss the biomechanics of a PTB prosthesis.
2. Discuss the cardiac rehabilitation protocol in both conservative and Surgically managed cardiac conditions.
3. Ethical issues in physiotherapy practice.
4. Explain detail about the Maitland concept of assessment.
5. **Discuss in detail about the following instrumentations:**
  - 5A. Signal averaging
  - 5B. Differential amplification
  - 5C. Gain and sensitivity
  - 5D. Surface electrodes
  - 5E. Filter

