

## MANIPAL UNIVERSITY

THIRD YEAR B.Sc. M.R.T. DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: BIOSTATISTICS AND RESEARCH METHODOLOGY

Monday, May 27, 2013

Time: 10:00-13:00 Hrs.

Max. Marks: 80

1. List the principles of qualitative research. (5 marks)
2. Describe internal validity and face validity. (5 marks)
3. What is the difference between qualitative and quantitative variables? Explain with examples. (5 marks)
4. Classify the following into different scales of measurements (Nominal, Ordinal, Interval and Ratio).
  - 4A. Address
  - 4B. Height
  - 4C. Heart rate
  - 4D. Ph value
  - 4E. Pain score
 (5 marks)
5. Explain judgment sampling. (5 marks)
- 6A. In a study of 252 patients admitted in a hospital, it was assessed whether patients were 'likely to be discharged', 'possibly to be discharged' or 'unlikely to be discharged'. The frequencies of these categories are shown in table below. Represent the data with the help of a pie chart.

Discharge	Frequency
Unlikely	126
Possibly	84
Likely	42

- 6B. Following are the fasting blood glucose level (mg/dl) of 30 children. Prepare a frequency table with 5 equal class intervals. Also find the relative frequencies.

62	65	56	64	63	77	72	79	62	73
57	57	59	67	62	61	61	60	55	75
57	65	75	65	68	61	60	68	69	67

(5+5 = 10 marks)

7. • Systolic blood pressure levels (mmHg) of ten patients who visited the OPD is as follows. Calculate mean, median, inter-quartile range and standard deviation.

105 120 125 112 125 120 115 130 116 101

(10 marks)

8. Given the mean and standard deviation of weight of new born babies are 3 kg and 0.5 kg respectively. Assuming normality estimate the percentage of newborns with weight.
- 8A. More than 2.5 kg
- 8B. Between 2.5 kg and 4 kg
- (5 marks)
9. Enumerate the properties of correlation with the help of scatter diagrams.
- (5 marks)
10. Describe health information system and its uses.
- (5 marks)
11. Define prevalence and incidence with examples. Distinguish between ratio and proportion.
- (10 marks)
12. What is descriptive epidemiology? Enumerate its uses and explain case series studies.
- (10 marks)



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**MANIPAL UNIVERSITY**

**THIRD YEAR B. Sc. M.R.T. DEGREE EXAMINATION – MAY 2013**

**SUBJECT: PRINCIPLES AND PRACTICE OF RADIOTHERAPY PART II**

Wednesday, May 29, 2013

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

✗ **Answer ALL the questions.**

1. What is meant by palliative care? Enumerate the different groups involved in the multidisciplinary approach to palliative care.
2. What are the common symptoms and signs of cancer of the cervix? How is cervical cancer staged?
3. What is the role of radiotherapy in the treatment of cancer of the vocal cord?
4. Describe the different volumes in radiotherapy planning.
5. What are the techniques of total body irradiation? What are the potential early and delayed complications of TBI?
6. Compare the advantages and disadvantages of Linear Accelerators and Co-60 teletherapy units.
7. What are the requirements for an ideal brachytherapy source?
8. What is the significance of positioning and immobilization in radiation therapy?

(10×8 = 80 marks)



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**MANIPAL UNIVERSITY**  
**THIRD YEAR B.Sc. M.R.T. DEGREE EXAMINATION – MAY 2013**  
**SUBJECT: PHYSICS OF RADIOTHERAPY PART II**

Friday, May 31, 2013

Time: 10:00-13:00 Hrs.

Max. Marks: 80

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1. **Answer the following questions:**

- 1A. What are the beam modifying devices used with a Co-60 teletherapy unit?
- 1B. Discuss any two quality assurance check to be done for a Linear Accelerator.
- 1C. Plot the isodose curves for a low energy open beam and high energy wedged beam. Explain them briefly.
- 1D. Define Collimator Scatter factor and Phantom Scatter factor.
- 1E. Write short notes on Manchester System of implantation.
- 1F. Write a short note on bending magnets.

(5×6 = 30 marks)

2. **Answer the following:**

- 2A. Define the Percentage Depth Dose and explain the factors it depends on.
- 2B. Discuss about various wedge systems.
- 2C. What are the features of Brachytherapy?
- 2D. Write in detail about the various portal imaging modalities available.
- 2E. Write in detail about electron beam energy specification and measurement.

(10×5 = 50 marks)

