Reg. No.										

MANIPAL UNIVERSITY

THIRD YEAR BASLP/B.Sc. M.L.T./B.Sc. C.V.T./B.Sc. M.R.T DEGREE EXAMINATION – DECEMBER 2014

SUBJECT: BASIC STATISTICS & SCIENTIFIC ENQUIRY IN AUDIOLOGY AND SPEECH LANGUAGE PATHOLOGY (NR)/BIOSTATISTICS (NR)/BIOSTATISTICS AND RESEARCH METHODOLOGY (2011 SCHEME)/(OLD REGULATION)

Wednesday, December 17, 2014

Time: 10:00-13:00 Hrs. Max. Marks: 80

1. Describe the steps involved in a research process.

(5 marks)

2. What are the characteristics of a good hypothesis?

(5 marks)

3. List out the differences between discrete and continuous variables with examples.

(5 marks)

4. Classify the following into different scales of measurements (Nominal, Ordinal, Interval and Ratio)

a) Name b) Age c) Intelligence Quotient (IQ)

d) Marital status e) Pain score

(5 marks)

5. Define and distinguish probability and non-probability sampling.

(5 marks)

6A. The following table shows tuberculin reaction measured in 206 persons who were never vaccinated. Present the data graphically by a histogram.

Reaction in mm	Number of persons
8 – 10	24
10 – 12	52
12 – 14	42
14 – 16	48
16 – 18	12
18 – 20	08
20 – 22	14
22 – 24	06

6B. The data gives the number of hours 45 hospital patients slept following the administration of a certain anesthetic. Construct frequency table taking class intervals 0 – 4, 4 – 8, 8 – 12, etc.

10	4	12	1	13	11	3	8	1
11	8	3	7	7	1	17	10	4
8	5	7	7	3	10	12	4	8
2	3	4	7	3	5	5	8	7
5	5	8	3	4	13	1	7	17

(5+5 = 10 marks)

7A. Calculate median and standard deviation of the following data:

Hb level (in gm%): 15 12 11 13 10 13 14 12 13 17

7B. Define coefficient of variation. Mean and standard deviation of pulse rate for a group of individuals is 76 and 3 beats per minute respectively. The mean and standard deviation of height is 64 and 2 inches respectively. Which of the two characteristics has lesser variability?

(5+5 = 10 marks)

8. A study on fasting blood glucose levels of patients reported a mean glucose level of 148mg/dl and a standard deviation of 11 mg/dl. Assuming normal distribution, what is the probability that any given individual will have blood glucose level,

8A. Between 126 and 159 mg/dl

8B. Less than 181 mg/dl

(5 marks)

9. With the help of scatter diagram, explain correlation.

(5 marks)

10. Define health information system. List its uses.

(5 marks)

11A. Explain the terms rate and ratio with examples.

11B. During the year 2010, there were 550 deaths in a town. The estimated mid-year population for 2010 for the town was 27500. Calculate the crude death rate.

(5+5 = 10 marks)

12. What do you mean by cross sectional studies? What are its uses? List the aims of epidemiology.

(10 marks)

Reg. No.										

MANIPAL UNIVERSITY

THIRD YEAR B. Sc. M.R.T. DEGREE EXAMINATION – DECEMBER 2014

SUBJECT: PRINCIPLES AND PRACTICE OF RADIOTHERAPY PART II

(2011 SCHEME)

Thursday, December 18, 2014

Time: 10:00 – 13:00 Hrs. Max. Marks: 80

Answer ALL the questions.

1. Write on the role of radiotherapy in definitive management of breast cancer.

2. What are the risk factors associated with the development of cancer cervix? What are the common symptoms and signs of cervical cancer?

3. What are the risk factors for the development of cancer of the oral cavity? What are the common signs and symptoms?

4. What are the common signs and symptoms of esophageal cancer? How is a patient with esophageal cancer planned for radiotherapy?

5. Write the advantages and disadvantages of kilovoltage modalities over megavoltage machines.

6. Enumerate the steps in radiotherapy (external beam) planning. Discuss simulation and verification in detail.

7. What are the merits and demerits of pre-loaded and after loaded brachytherapy?

8. Make a short note on stereotactic radio surgery and stereotactic radio therapy.

(10 marks × 8 = 80 marks)

Reg. No.										

MANIPAL UNIVERSITY

THIRD YEAR B.Sc. M.R.T. DEGREE EXAMINATION – DECEMBER 2014

SUBJECT: PHYSICS OF RADIOTHERAPY PART II

(2011 SCHEME)

Friday, December 19, 2014

Time: 10:00-13:00 Hrs. Max. Marks: 80

PART – A

1. **Answer all the questions:**

1A. Draw a block diagram of LINAC and with proper labeling.

1B. Write a short note on bending magnets.

1C. Write about individualized and universal wedge systems.

1D. Write about TMR and its properties.

1E. Write a short note on intracavitary brachytherapy.

1F. Discuss any two quality assurance check to be done for a Brachytherapy unit.

(5 marks × 6 = 30 marks)

PART – B

2. **Answer all of the following questions:**

2A. Explain PDD and TAR and the relation between the two quantities.

2B. Explain the tumor and target volumes using ICRU 50 and 62.

2C. Write in detail about electron beam energy specification.

2D. Write about problems of adjacent fields and how are they matched.

2E. Write in detail about Electronic Portal Imaging.

(10 marks × 5 = 50 marks)

Reg. No.										

MANIPAL UNIVERSITY

THIRD YEAR B.Sc. M.R.T. DEGREE EXAMINATION – DECEMBER 2014

SUBJECT: RADIATION PROTECTION, STANDARDS AND REGULATIONS

(2011 SCHEME)

Saturday, December 20, 2014

Time: 10:00-13:00 Hrs. Max. Marks: 80

Answer the following:

1. Explain the system of radiological protection. Mention the recommended dose limits for both occupational workers and public.

(10 marks)

2. Write in detail about planning of a Brachytherapy room with a typical layout.

(10 marks)

3. Enumerate the duties of a Radiation safety officer.

(10 marks)

4. Write in detail about Personnel monitoring devices.

(10 marks)

5A. Write a note on Transport Index and Categories of Transport Containers for Radioactive Sources.

5B. Write about the important features of Type A and Type B package.

(5+5 = 10 marks)

6A. Write briefly about shielding in control of external radiation hazard. The exposure rate from a Cs 137 source is 100 cGy/hour. What is the thickness of lead required to reduce this exposure to 10 mGy/hour? (HVL 0.6cm lead)

6B. Discuss about stochastic effects.

(5+5 = 10 marks)

7. Discuss the factors to be taken into account for calculating the wall thickness for Teletherapy installations.

(10 marks)

8. What are the basic guidelines for disposal of radioactive waste? Explain each with an example.

(10 marks)