

# MANIPAL UNIVERSITY

FIRST YEAR MOT/M.Sc. (RRT & DT)/ M.Sc. RT/ M.A.S.L.P/M.Sc. MLT/M.Sc. MIT/  
M.Sc. ECHOCARDIOGRAPHY/M. OPT DEGREE EXAMINATION – JUNE 2015

**SUBJECT: ADVANCED BIOSTATISTICS & RESEARCH METHODOLOGY/ STATISTICS &  
RESEARCH METHODS/BIOSTATISTICS/EPIDEMIOLOGY & BIOSTATISTICS /  
RESEARCH METHODOLOGY & BIOSTATISTICS**

Tuesday, June 02, 2015

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

**✍ Answer ALL the questions.**

- 1A. With the help of suitable examples discuss the quantitative and qualitative variables.
- 1B. Explain systematic random sampling with an example. What are the advantages and disadvantages of this method?  
(5+5 = 10 marks)
- 2A. Discuss skewness and kurtosis.
- 2B. A sample of 50 liver cirrhosis subjects were selected and the mean serum potassium level was observed to be 5.4 mEq/L with standard deviation of 2.5 mEq/L. Find the 95% and 99% confidence intervals for mean serum potassium level among liver cirrhosis subjects. (The standard normal table values for 95% and 99% confidence levels are 1.96 and 2.58 respectively).  
(5+5 = 10 marks)
- 3A. Enumerate the steps in hypothesis testing.
- 3B. What do you mean by non-parametric tests? With suitable examples briefly explain the applications of Mann Whitney U test and Wilcoxon signed rank test.  
(5+5 = 10 marks)
4. The mean serum cholesterol level of 25 randomly selected normal healthy men is 240 mg/dl with a standard deviation of 40 mg/dl. The mean serum cholesterol level of 20 randomly selected men who undergone coronary bypass surgery during the preceding two year period is 260 mg/dl with standard deviation of 56 mg/dl.
- 4A. Name the statistical test used for comparing the mean serum cholesterol levels between the two groups.
- 4B. Write the null hypothesis and alternate hypothesis for this test.
- 4C. What are the assumptions for this test?
- 4D. Compute the value of test statistic for the above study.
- 4E. Briefly explain how do you take a decision on acceptance and rejection of null hypothesis for the above study.  
(1+1+2+4+2 = 10 marks)

- 5A. Explain how do you compute sample size for comparing means of two independent groups.
- 5B. A research team conducted a case-control study examining the relationship between daily alcohol consumption and liver cancer. The team selected 2000 cases and 2000 controls and observed that 700 cases and 400 controls daily take alcohol. Make a two by two table and find the appropriate measure of strength of association between alcohol consumption and liver cancer. How do you interpret it?

(5+5 = 10 marks)

6. What do you mean by randomization in RCTs? Explain the simple, block and stratified randomization methods.

(1+9 = 10 marks)

7. Explain the structure of research thesis.

(10 marks)

8. **Write short notes on:**

- 8A. Survival analysis
- 8B. Validity and reliability of diagnostic tools

(5+5 = 10 marks)



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# MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.I.T. DEGREE EXAMINATION – JUNE 2015

SUBJECT: RADIOGRAPHIC PROCEDURES

Thursday, June 04, 2015

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 80

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✍ **Answer ALL the questions.**

1. Describe the views taken in skeletal survey in detail and mention the indications for the same.  
(20 marks)

2. **Short notes:**

2A. Mention special views taken for Chest and explain any two in detail.

2B. Radiographic views for Acute Abdomen series

2C. “Scotty dog” view

2D. Contrast media adverse reactions

2E. Barium meal

2F. T-tube cholangiography

(10 marks × 6 = 60 marks)



Reg. No.

# MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.I.T. DEGREE EXAMINATION – JUNE 2015

SUBJECT: INSTRUMENTATION OF CONVENTIONAL RADIOLOGY EQUIPMENTS

Saturday, June 06, 2015

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 80

✍ Answer ALL the questions.

✍ Major question:

1. Explain in detail about anatomically programmed generator and modular generators with diagram.

(20 marks)

2. Write short notes on:

2A. Fuses and its application

2B. Self-Rectified high tension circuit

2C. Delay circuit in x ray tube

2D. Regulating and safety devices used in x ray equipment

2E. Stabilizers and UPS

2F. Different types of grid movements

(10 marks × 6 = 60 marks)



**MANIPAL UNIVERSITY****FIRST YEAR M.Sc. M.I.T. DEGREE EXAMINATION – JUNE 2015****SUBJECT: PRINCIPLES OF RADIOGRAPHIC EXPOSURE**

Tuesday, June 09, 2015

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 80

**✍ Answer ALL the questions**

1. Discuss briefly the significance of the characteristic curve.

(20 marks)

2. **Write short notes on:**

2A. Reject film analysis

2B. Geometry of the radiographic image

2C. Laser films

2D. Light sensitive photographic films

2E. MTF

2F. Application and influence of distance in photography

(10 marks × 6 = 60 marks)





**MANIPAL UNIVERSITY****FIRST YEAR M.Sc. M.I.T. DEGREE EXAMINATION – JUNE 2015****SUBJECT: INSTRUMENTATION OF SPECIALIZED RADIOLOGY EQUIPMENTS**

Thursday, June 11, 2015

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 80

**✍ Essay:**

1. Discuss about the kinds of camera tube in use for image intensification and describe about a panel type image Intensifier.

(20 marks)

**2. Short notes:**

- 2A. Discuss about the types of digital imaging artefacts and the remedies to avoid them.  
2B. Explicate the device used to obtain panoramic tomographs of the jaws and face.  
2C. Describe the equipment's used for rapid serial radiography.  
2D. Discuss the relevant features of a storage phosphor imaging plate and the operating characteristics of a CR reader.  
2E. Narrate the differences between direct and in-direct digital radiography.  
2F. Give details about the types of Mobile Radiography.

(10 marks × 6 = 60 marks)



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## MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.I.T. DEGREE EXAMINATION – JUNE 2015

SUBJECT: ADVANCED TECHNIQUES & INSTRUMENTATION OF ULTRASOUND

Saturday, June 13, 2015

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 80

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✍ Answer ALL the questions.

1. Write detail note on quality control test for Ultrasound equipment's followed in India.  
(20 marks)

2. Short notes:

2A. Ultrasound protocol for abdomen and pelvis

2B. Color and Power doppler

2C. Post- processing techniques in ultrasonography

2D. Doppler spectral analysis

2E. Protocol for renal artery doppler

2F. Doppler instrumentation

(10 marks × 6 = 60 marks)



Reg. No.

## MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.I.T. DEGREE EXAMINATION – JUNE 2015

SUBJECT: ADVANCED TECHNIQUE & INSTRUMENTATION OF CT

Monday, June 15, 2015

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 80

✍ **Answer ALL the questions**

1. Discuss briefly the principle, instrumentation, data acquisition and clinical application of PET/CT.

(20 marks)

2. **Write short notes on:**

2A. Pediatrics CT protocol

2B. CT detector technology

2C. Coronary angiography

2D. Dose comparison between SSCT and MDCT

2E. Isotropic Imaging

2F. CT enteroclysis

(10 marks × 6 = 60 marks)

