

# Question Paper

Exam Date & Time: 16-May-2022 (10:00 AM - 12:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc. ESS/B.Sc. MLT/ B.Sc. MRT/ B.Sc. MIT / B.Sc. RRT & DT/EIGHTH SEMESTER BPT/BOT  
DEGREE EXAMINATION - MAY 2022

SUBJECT: STAT 402 - BIOSTATISTICS & RESEARCH METHODOLOGY /BASIC BIOSTATISTICS & RESEARCH  
METHODOLOGY/BIOSTATISTICS  
(2016 SCHEME/2016 RV SCHEME)

Marks: 50

Duration: 120 mins.

Answer all the questions.

1. Briefly explain the following:

- |     |                                |     |
|-----|--------------------------------|-----|
| 1A) | Ordinal scale.                 | (2) |
| 1B) | General Fertility Rate (GFR).  | (2) |
| 1C) | Infant Mortality Rate (IMR).   | (2) |
| 1D) | Maternal Mortality Rate (MMR). | (2) |
| 1E) | Ecological Fallacy.            | (2) |

2. Write short notes on the following:

- |     |                    |     |
|-----|--------------------|-----|
| 2A) | Types of variables | (5) |
| 2B) | Census             | (5) |

- 3) Erythrocyte Sedimentation Rate (ESR) readings (in mm) of 12 tuberculosis patients are given below. (10)  
12 8 11 9 8 14 8 12 8 9 11 10  
Calculate the value of Coefficient of variation and Range of the data.  
((2+5)+3 = 10 marks)

- 4) A random sample of 150 children had a mean urinary lead concentration of 3.15  $\mu\text{mol}/24\text{hr}$ , with standard deviation 0.75. Construct reference range which includes 95% of the observations. (5)

5. A researcher wants to predict vital capacity of lungs (i.e. is the maximum amount of air a person can expel from the lungs after a maximum inhalation, measured in litres) using height of the individuals (measured in cms). A simple linear regression model was fit and it was found that the slope for height was 0.2. The intercept for the model was -0.5. Using the model obtained from this study, answer the following questions:

- |     |   |       |
|-----|---|-------|
| 5A) | State the dependent variable and independent variable of the fitted model.      | (3)   |
| 5B) | Write the form of simple linear regression model using the slope and intercept. | (3.5) |

5C) Interpret the value of slope. (3.5)

6) 'Correlation does not imply causation'. Explain this statement with an example. (5)

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# Question Paper

Exam Date & Time: 18-May-2022 (10:00 AM - 12:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc. MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION - MAY 2022  
SUBJECT: BMIT 302- IMAGING PHYSICS AND DARKROOM TECHNIQUES (PART II)  
(2016 SCHEME)

Answer ALL questions.

Draw diagram wherever necessary.

Marks: 50

Duration: 120 mins.

- |     |   |      |
|-----|---|------|
| 1)  | Explain Main Voltage Compensation in detail.  | (10) |
| 2)  | Explain in detail the Design, Construction & working principle of Metal Ceramic X-ray Tube. | (10) |
| 3A) | Full Wave Rectifiers.   | (5)  |
| 3B) | Principle of Grid Controlled X-ray Tube.  | (5)  |
| 3C) | P-N junction Diodes.  | (5)  |
| 3D) | Motion Artefacts.   | (5)  |
| 4A) | Draw and label Delta Connection Circuit.  | (2)  |
| 4B) | Advantages of Rotating Anode X-ray Tube.  | (2)  |
| 4C) | Compound Filters.   | (2)  |
| 4D) | Distortion.   | (2)  |
| 4E) | Steps involved in Automatic Film Processing.  | (2)  |

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# Question Paper

Exam Date & Time: 20-May-2022 (10:00 AM - 12:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc. MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION - MAY 2022  
SUBJECT: BMIT 304 - RADIOLOGICAL PROCEDURES AND PATIENT CARE (PART II)  
(2016 SCHEME)

Marks: 50

Duration: 120 mins.

Answer all the questions.

- 1) Explain the anatomy of large bowel. Discuss in detail the radiographic procedure to study the large bowel (10)
- 2) Explain the anatomy of cervical spine and views taken for atlas and axis (10)
- 3A) Explain mortise view (5)
- 3B) Explain indications, contraindication and technique of FTR in detail (5)
- 3C) List out the views taken for intercondylar fossa and explain any one view in detail (5)
- 3D) Explain Percutaneous transluminal balloon angioplasty (5)
- 4A) Indication and contraindication of enteroclysis (2)
- 4B) Filmings in HSG (2)
- 4C) Name the view taken to see cervicothoracic junction (2)
- 4D) Indication and contraindications of dacrocystography (2)
- 4E) Indication and contraindication of four vessel angiography (2)

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# Question Paper

Exam Date & Time: 23-May-2022 (10:00 AM - 12:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc. MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION - MAY 2022  
SUBJECT : BMIT 306: RECENT TRENDS IN COMPUTED TOMOGRAPHY  
(2016 SCHEME)

Answer ALL questions.

Marks: 50

Duration: 120 mins.

- |     |   |      |
|-----|---|------|
| 1)  | Discuss briefly the characteristics Computed Tomography image quality | (10) |
| 2)  | Explain briefly CT contrast media                                     | (10) |
| 3A) | Post processing techniques  | (5)  |
| 3B) | PACS  | (5)  |
| 3C) | Protocol for upper LIMB angiography                                   | (5)  |
| 3D) | CT guided procedures.   | (5)  |
| 4A) | Advantages of CT over other imaging modalities                        | (2)  |
| 4B) | Pitch   | (2)  |
| 4C) | Ring artefact   | (2)  |
| 4D) | Automatic exposure control  | (2)  |
| 4E) | CT filter   | (2)  |

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# Question Paper

Exam Date & Time: 25-May-2022 (10:00 AM - 12:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc. MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION - MAY 2022  
SUBJECT: BMIT 308- RECENT TRENDS IN MAGNETIC RESONANCE IMAGING  
(2016 SCHEME)

Answer ALL questions.

Draw suitable diagrams wherever required.

Marks: 50

Duration: 120 mins.

### 1. Major Questions :

- 1A) Explain difference between spin echo and gradient echo sequences. (10)  
1B) Explain phase contrast MRA. (10)

### 2. Short Answers :

- 2A) Explain the effect of application of RF pulse on hydrogen nuclei inside the human body during MRI examination. (4)  
2B) Write a short note on intrinsic MRI parameters. (4)  
2C) Define SNR. How NEX affect SNR and scan time. (4)  
2D) Write a short note on even echo rephrasing. (4)  
2E) Write a note on chemical shift artifact. (4)

### 3. Very Short Answers :

- 3A) Define MR active nuclei. (2)  
3B) Define Spin lattice relaxation. (2)  
3C) What are the main two functions of gradient? (2)  
3D) List factors affecting scan time in MRI. (2)  
3E) Define CNR. (2)

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