

MANIPAL UNIVERSITY

**FRIST YEAR MASLP / MSc. MLT / MSc. NMT / MSc. MIT / SECOND SEMESTER M.Sc.
CLINICAL PSYCHOLOGY / MSc MRP / M.Sc. HHIA / MSc MIT DEGREE
EXAMINATION – DECEMBER 2016**

**SUBJECT: STATISTICS & RESEARCH METHODS (SH 101) / BIOSTATISTICS / ADVANCED
BIOSTATISTICS & RESEARCH METHODOLOGY (PAPER IV) / BIOSTATISTICS / ADVANCED
BIOSTATISTICS & RESEARCH METHODOLOGY (MCP 106) / RESEARCH METHODOLOGY &
BIOSTATISTICS / EPIDEMIOLOGY & BIOSTATISTICS (MHI 606) / BIOSTATISTICS (MIT 203)**

Thursday, December 15, 2016

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

Answer ALL the questions.

- 1A. Define mean, median, mode, standard deviation and coefficient of variation.
- 1B. Define sample and sampling.
- 1C. What are the characteristics of a good sample?

(5+2+3 = 10 marks)

- 2A. Define sampling distribution and standard error.
- 2B. Explain the formula for 95% confidence interval for:
 - i) Mean
 - ii) Proportion
 - iii) Difference between two means
 - iv) Difference between two proportions

(2+ (2 marks × 4) = 10 marks)

- 3A. Explain the test used for comparing the mean of a variable before and after an intervention in a sample of individuals.
- 3B. In a survey, 246 urban school children and 349 rural school children were examined for conductive hearing loss. Out of 246 urban children, 36 suffered from conductive hearing loss while among rural school children 61 suffered with hearing loss. Test whether the proportion of hearing loss differs between urban and rural children at 5% level of significance. The table value is given as 3.84.

(5+5 = 10 marks)

4. Discuss with suitable examples:
 - i) ANOVA
 - ii) Repeated measures ANOVA

(5+5 = 10 marks)

5. Explain the design, analysis, merits and demerits of a randomized controlled trial.

(10 marks)

- 6A. Describe cross sectional study design with an example.
- 6B. A study has been planned to compare the mean hearing thresholds levels between urban and rural children. How many children are required in each group if an average difference of 4 decibels is considered as clinically important with 80% power and 1% level of significance? The standard deviation of hearing threshold level is expected to be 7 decibels. The table value for 80% power and 1% level of significance is 0.84 and 2.58 respectively.

(5+5 = 10 marks)

7. Explain the structure of a research protocol.

(10 marks)

8. **Write short notes on:**

- 8A. Reliability of a diagnostic test
- 8B. Systematic reviews and meta-analysis

(5+5 = 10 marks)



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MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.I.T. DEGREE EXAMINATION – DECEMBER 2016

SUBJECT: ADVANCED TECHNIQUES & INSTRUMENTATION OF ULTRASOUND TECHNIQUES

Friday, December 16, 2016

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 80

✍ **Answer ALL the questions.**

1. Describe pulse echo ultrasound instrumentation in detail.

(20 marks)

2. **Short notes:**

2A. Ultrasound protocol for obstetric imaging

2B. High Intensity focused ultrasound

2C. 3D and 4D transducers

2D. Doppler artefacts

2E. Harmonic imaging

2F. Protocol for Carotid and Vertebral artery Doppler

(10 marks × 6 = 60 marks)



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MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.I.T. DEGREE EXAMINATION – DECEMBER 2016

SUBJECT: ADVANCED TECHNIQUE & INSTRUMENTATION OF CT TECHNIQUES

Saturday, December 17, 2016

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 80

 **Answer ALL the questions.**

1. Discuss briefly the factors affecting the patient's dose.

(20 marks)

2. **Write short notes on:**

2A. Comparison of virtual and conventional bronchoscopy

2B. CT Fluoroscopy

2C. Slip ring technology

2D. CT Denta scan

2E. Rendering Techniques

2F. CT colonoscopy

(10 marks × 6 = 60 marks)



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MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.I.T. DEGREE EXAMINATION – DECEMBER 2016

SUBJECT: PRINCIPLES OF RADIOGRAPHIC EXPOSURE

Monday, December 19, 2016

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 80

✍ **Answer ALL the questions.**

✍ **Essay:**

1. Describe about the instrumentation and quality control tests of an automatic film processor.
(20 marks)

2. **Short notes:**

2A. Discuss in detail about the tool used to measure sensitometry.

2B. Describe about automixers and its functions.

2C. Compare Automatic and day light processing in detail.

2D. Narrate film artefacts and the remedies to overcome it.

2E. Outline Micro and Macro radiography.

2F. Describe the interaction of X-rays with matter and its biological, clinical significance.

(10 marks × 6 = 60 marks)



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MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.I.T. DEGREE EXAMINATION – DECEMBER 2016

SUBJECT: INSTRUMENTATION OF SPECIALIZED RADIOLOGY EQUIPMENTS

Tuesday, December 20, 2016

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 80

✍ **Answer ALL the questions:**

✍ **Essay:**

1. Describe the quality control tests for Mammography and itemize the mammographer's quality control duties on a weekly, monthly and annual basis.

(20 marks)

2. **Short notes:**

- 2A. Explain the principles which govern the sharpness of the fluoroscopic image.
- 2B. Discuss about the camera tubes used for image intensification in medical radiology.
- 2C. Describe about Indirect digital radiography. Add note on the use of Si, CsI and GdOS in DR.
- 2D. Explicate the characteristics of digital Imaging that should result in lower patient radiation dose. Add note on Contrast - detail Curve.
- 2E. Explain Orthopantomography.
- 2F. Compare Portable and Mobile radiographic equipment's.

(10 marks × 6 = 60 marks)



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MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.I.T. DEGREE EXAMINATION – DECEMBER 2016

SUBJECT: RADIOGRAPHIC PROCEDURES

Wednesday, December 21, 2016

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 80

Answer ALL the questions.

1. Explain the application, types, safety aspects, mode and volume of administration and administration techniques of contrast media in Urinary and GIT procedures.

(20 marks)

2. **Short notes:**

- 2A. Special conditions in Barium swallow
- 2B. Views for Zygomatic arch fracture
- 2C. Fistulography
- 2D. Merchant's view
- 2E. HSG
- 2F. Caldwell's view

(10 marks × 6 = 60 marks)



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MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.I.T. DEGREE EXAMINATION – DECEMBER 2016

SUBJECT: INSTRUMENTATION OF CONVENTIONAL RADIOLOGY EQUIPMENTS

Thursday, December 22, 2016

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 80

✍ Answer ALL the questions.

✍ Essay:

1. Explicate generators and its types.

(20 marks)

2. Short notes:

2A. Give details about fuses and circuit breakers.

2B. Outline interlocking circuits.

2C. Explain about the secondary radiation grids.

2D. Discuss about exposure timers.

2E. Mention the components and working principle of stabilizers and UPS.

2F. Write in detail about autotransformer. Add a note about the laws of transformers.

(10 marks × 6 = 60 marks)

