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MANIPAL UNIVERSITY

SIXTH SEMESTER B.Sc. M.I.T DEGREE EXAMINATION – JUNE 2017

**SUBJECT: BIOSTATISTICS (MIT 312)
(2014 SCHEME)**

Thursday, June 01, 2017

Time: 10:00-13:00 Hrs.

Max. Marks: 80

Answer ALL the questions.

1. List and define different types of variables. (6 marks)

2. **Classify the following into the four different scales of measurement:**

2A. Stages of cancer

2B. Blood group

2C. Pain score (mild/moderate/sever)

2D. Age

(4 marks)

3. Thirty seven persons were examined for haemoglobin level in their blood (mg per dl). Construct a frequency polygon for the data.

Hb (mg/dl)	11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	16 - 17
No. of persons	5	10	15	4	2	1

(4 marks)

4. Compute 65th percentile and standard deviation for the following data regarding weight of infants (in kg.).

2.32 2.36 2.89 3.03 3.86 2.90 4.01 3.69 3.07 2.87

(10 marks)

5. Data below shows the number of colonies of bacteria grown on ten agar plates. Calculate median and interquartile range.

60 70 100 160 140 80 110 95 130 115

(10 marks)

6. **Define the following:**

6A. Perinatal mortality rate

6B. Crude birth rate

(2+2 = 4 marks)

7. Describe correlation using scatter plots.

(6 marks)

8. The amount of weight gained during pregnancy was assessed and was found to be approximately normally distributed with a mean weight gain of 12 kgs and a standard deviation of 4 kgs. Calculate the proportion of pregnant mothers who gained weight:
- 8A. Less than 20 kgs
 - 8B. Between 12 to 16 kgs
 - 8C. At least 8 kgs

(2 marks \times 3 = 6 marks)

9. **Write short notes on:**

- 9A. Reliability
- 9B. Epidemiology and its aims
- 9C. Systematic sampling
- 9D. Characteristics of good hypothesis
- 9E. Disease Registries
- 9F. Case reports

(5 marks \times 6 = 30 marks)



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MANIPAL UNIVERSITY

SIXTH SEMESTER B.Sc. M.I.T. DEGREE EXAMINATION – JUNE 2017

SUBJECT: MIT 302 – PHYSICS & INSTRUMENTATION OF RADIOGRAPHIC EQUIPMENTS (PART 2)
(2014 SCHEME)

Saturday, June 03, 2017

Time: 10.00-13.00 Hrs.

Max. Marks: 80

- ✍ Answer ALL questions.
- ✍ Draw diagrams wherever necessary.

1. **Explain in detail:**

- 1A. Explain the x-ray circuit in detail.
- 1B. Principle of transformers, design efficiency of transformers and sources of power losses.
(15 marks × 2 = 30 marks)

2. **Write short notes on the following:**

- 2A. Power storage generators
- 2B. Thermal and Magnetic relay circuit
- 2C. Stabilizers
- 2D. Single phase and poly phase power supply
- 2E. Beam restricting devices
(6 marks × 5 = 30 marks)

3. **Discuss the following:**

- 3A. Anode heel effect
- 3B. Image intensifier
- 3C. Filament circuit
- 3D. Main voltage drop and its remedy
(5 marks × 4 = 20 marks)



MANIPAL UNIVERSITY**SIXTH SEMESTER B.Sc. M.I.T. DEGREE EXAMINATION – JUNE 2017****SUBJECT: MIT 304 – RADIOLOGICAL PROCEDURES AND PATIENT CARE (PART 2)
(2014 SCHEME)**

Tuesday, June 06, 2017

Time: 10.00-13.00 Hrs.

Max. Marks: 80

- ✍ **Answer ALL the questions.**
- ✍ **Draw diagrams wherever required.**

1. Explain in detail:

- 1A. Describe the Indication, Contraindication, Filming and Procedure for Angiography.
- 1B. List the views taken for Cervical Spine. Explain open mouth view in detail.

(15 marks × 2 = 30 marks)

2. Write short notes on the following:

- 2A. Explain filming technique for Sialography
- 2B. Explain view taken to visualize the Scotty dog sign
- 2C. Explain the pre and post-procedure care in Angiography procedure
- 2D. Explain the procedure and technique for FTR
- 2E. Explain wagging jaw method

(6 marks × 5 = 30 marks)

3. Discuss the following:

- 3A. Guide wires
- 3B. View taken to visualize the coccyx
- 3C. Describe the technique for Dacrocystography
- 3D. Tunnel Method

(5 marks × 4 = 20 marks)



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SIXTH SEMESTER B.Sc. M.I.T. DEGREE EXAMINATION – JUNE 2017

**SUBJECT: MIT 306 – COMPUTED TOMOGRAPHY
(2014 SCHEME)**

Thursday, June 08, 2017

Time: 10.00-11.30 Hrs.

Max. Marks: 40

- ✍ **Answer ALL the questions.**
- ✍ **Draw diagram wherever required.**

1. Long answers:

- 1A. Discuss in detail the cause, appearances and remedy of Computed Tomography Artefacts.
- 1B. Discuss in detail the Computed Tomography image reconstruction techniques.

(10 marks × 2 = 20 marks)

2. Write short notes on the following:

- 2A. Adverse reactions of Contrast media
- 2B. Role of technologist during Computed tomography scan.
- 2C. Scintillation detector
- 2D. Window width and window level
- 2E. 3D volume rendering technique.

(4 marks × 5 = 20 marks)



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SIXTH SEMESTER B.Sc. M.I.T. DEGREE EXAMINATION – JUNE 2017

SUBJECT: MIT 308 – MAGNETIC RESONANCE IMAGING
(2014 SCHEME)

Saturday, June 10, 2017

Time: 10.00-11.30 Hrs.

Max. Marks: 40

- ✍ Answer ALL the questions.
- ✍ Draw suitable diagrams wherever required.

1. **Major questions:**

- 1A. Explain the techniques to optimize SNR in MRI.
- 1B. Explain parameters and application of coherent and incoherent gradient echo sequences.
(10 marks × 2 = 20 marks)

2. **Short answers:**

- 2A. Write a note on different zones in MRI facilities.
- 2B. Define spatial resolution. Explain parameter to optimize spatial resolution in MRI.
- 2C. Define artifact. Explain appearance, cause and remedy for chemical shift artifact.
- 2D. Write a note on multiple overlapping thin section angiography (MOTSA).
- 2E. Write a note on Specific absorption rate.
(4 marks × 5 = 20 marks)



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SIXTH SEMESTER B.Sc. M.I.T. DEGREE EXAMINATION – JUNE 2017

SUBJECT: MIT 310 – NUCLEAR MEDICINE TECHNOLOGY
(2014 SCHEME)

Tuesday, June 13, 2017

Time: 10.00-11.30 Hrs.

Max. Marks: 40

- ✍ Answer ALL the questions.
- ✍ Draw diagrams wherever required.

1. Explain in detail:

- 1A. Define Radioactivity and explain the modes of radioactive decay.
- 1B. Explain the Storage of radioactive materials and Procedures for handling spills.

(10 marks × 2 = 20 marks)

2. Write short notes on the following:

- 2A. Principle of PET Imaging
- 2B. Contamination monitor
- 2C. Bone scan
- 2D. Anger camera

(5 marks × 4 = 20 marks)

