

B.Sc. NUCLEAR MEDICINE TECHNOLOGY

FIRST YEAR

PAPER II – IMAGE PROCESSING TECHNIQUES

Q.P. Code: 802102

Time : Three Hours

Maximum : 100 marks

Answer ALL questions

I. Elaborate on:

(3 x 10 = 30)

1. What is Central Processing Unit (CPU) in a computer, briefly write about its components.
2. Advantages of digital image processing in Nuclear Medicine applications.
3. Processing and extraction of physiological data in Nuclear Medicine Imaging.

II. Write notes on:

(8 x 5 = 40)

1. Computer Net work.
2. Image Artifacts.
3. Digitizing x-ray images.
4. Fundamentals of medical image processing.
5. Ideal settings for image viewing.
6. Spatial resolution.
7. Wet film processing.
8. Color images and its digital representation.

III. Short Answers on:

(10 x 3 = 30)

1. Dry bench in a dark room.
2. Factors determining x-ray film image quality.
3. Importance of software in a computer.
4. Restoration of Digital Images.
5. Picture Archiving and Communication System.
6. Quality control of medical images.
7. Types of x-ray films.
8. Image distortion.
9. Data display.
10. Image storage devices.

B.Sc. NUCLEAR MEDICINE TECHNOLOGY

FIRST YEAR

PAPER II – IMAGE PROCESSING TECHNIQUES

Q.P. Code: 802102

Time : Three Hours

Maximum : 100 marks

Answer ALL questions

I. Elaborate on:

(3 x 10 = 30)

1. What is telemedicine? Explain the role of networking in nuclear medicine?
2. What are the image processing equipments? Enumerate advantages and disadvantage of each?
3. What are back ups and why are they important? What methods are there for performing back up and which is the best?

II. Write notes on:

(8 x 5 = 40)

1. What is Nyquist frequency?
2. What is the purpose of filtering the image?
3. What is the difference between scatter and attenuation correction?
4. PACS.
5. How is attenuation correction performed in PET camera?
6. What is meant by 'OPEN ARCHITECTURE'?
7. Can the computer correct for artifacts due to motion?
8. Enumerate type of X ray films. How would you choose films for different studies ?

III. Short Answers on:

(10 x 3 = 30)

1. Surface rendering (3D display).
2. Volume rendering (3D display).
3. List mode acquisition.
4. IP Address.
5. How often the data should be backed up.
6. Point spread function.
7. Cut of frequency or critical frequency.
8. Image segmentation.
9. Filtered back projection.
10. Image filters.

[LB 0212]

AUGUST 2012

Sub. Code: 2102

B.Sc. NUCLEAR MEDICINE TECHNOLOGY

FIRST YEAR

PAPER II – IMAGE PROCESSING TECHNIQUES

Q.P. Code : 802102

Time : Three hours

Maximum : 100 marks

(180 Mins) Answer ALL questions in the same order.

I. Elaborate on:

Pages Time Marks
(Max.)(Max.)(Max.)

- | | | | |
|---|---|----|----|
| 1. The various methods of storage and processing of digital images in nuclear medicine. | 7 | 20 | 10 |
| 2. The different output devices used in computers in nuclear medicine. | 7 | 20 | 10 |
| 3. The parameters related to optimum viewing of nuclear medicine images. | 7 | 20 | 10 |

II. Write notes on:

- | | | | |
|---|---|----|---|
| 1. Analog to digital converters. | 4 | 10 | 5 |
| 2. Pixel. | 4 | 10 | 5 |
| 3. Operating system. | 4 | 10 | 5 |
| 4. Flat panel monitors. | 4 | 10 | 5 |
| 5. Contrast enhancement. | 4 | 10 | 5 |
| 6. Image resolution. | 4 | 10 | 5 |
| 7. Day light film processing. | 4 | 10 | 5 |
| 8. Radioactive markers used in imaging. | 4 | 10 | 5 |

III. Short answers on:

- | | | | |
|---|---|---|---|
| 1. Data base. | 2 | 4 | 3 |
| 2. Hardware. | 2 | 4 | 3 |
| 3. Optical disc. | 2 | 4 | 3 |
| 4. Random access memory (RAM). | 2 | 4 | 3 |
| 5. Bytes. | 2 | 4 | 3 |
| 6. Window levels in image display. | 2 | 4 | 3 |
| 7. Colour scale. | 2 | 4 | 3 |
| 8. Hounsfield units. | 2 | 4 | 3 |
| 9. Teleradiology. | 2 | 4 | 3 |
| 10. Digital Imaging and Communications in Medicine (DICOM). | 2 | 4 | 3 |

[LC 0212]

FEBRUARY 2013

Sub. Code: 2102

B.Sc. NUCLEAR MEDICINE TECHNOLOGY

FIRST YEAR

PAPER II – IMAGE PROCESSING TECHNIQUES

Q.P. Code : 802102

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

I. Elaborate on:

(3X10=30)

1. The various methods of display of nuclear medicine images.
2. The different factors affecting the image quality in diagnostic nuclear medicine.
3. The film processing systems used in nuclear medicine.

II. Write notes on:

(8X5=40)

1. Digital to analog converters.
2. Voxel.
3. Image acquisition interface.
4. Cathode ray tubes.
5. Windowing.
6. Image contrast.
7. Dry processing of films.
8. Surface marking in imaging.

III. Short answers on:

(10X3=30)

1. Word processing.
2. Key board.
3. Magnetic tape.
4. Read-only memory (ROM).
5. Megabytes.
6. Lower & upper window levels of image display.
7. Gray scale.
8. Filtered back projection.
9. Slice thickness.
10. Society of Motion Picture Test Engineers (SMPTE) test pattern.

[LD 0212]

AUGUST 2013

Sub.Code :2102

**B.SC. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR
PAPER –II – IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three hours

Maximum : 100 Marks

Answer All questions

I Elaborate on: **(3x10 =30)**

1. Enumerate process involved in image processing.
2. Elaborate type of image processing equipment and hard copy.
3. What are the regular maintaining procedures that you would do to ensure your software and hardware perform effectively?

II. Write Notes on: **(8 x 5 = 40)**

1. Types of X-ray films and their usage.
2. Image filtering.
3. Manual dark room processing.
4. Operating system.
5. Grey scale and color display.
6. Difference between a digital and analog image.
7. IP address.
8. Matrix size.

III. Short Answers on: **(10 x 3 = 30)**

1. Storage devices.
2. Data archiving.
3. Telemedicine.
4. PACS.
5. Time activity curve.
6. Functional and parametric images.
7. Back up and restore operation.
8. 3 D Display/Surface & Volume rendering.
9. Back ground correction.
10. Automatic film processor.

[LE 0212]

FEBRUARY 2014

Sub.Code :2102

**B.SC. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR
PAPER –II – IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on: **(3x10 =30)**

1. Explain the various processes involved in the 'Nuclear Medicine Image Acquisition' with schematics
2. What is meant by 'Operating System' and enumerate its desirable characteristics
3. Role of computers in Nuclear Medicine

II. Write Notes on: **(8 x 5 = 40)**

1. Acquisition & Processing Computers in a Nuclear Medicine Department.
2. Image Filtering
3. Word Processing-Its uses in Nuclear Medicine
4. Basic steps involved in Hard copy generation in Nuclear Medicine
5. Types of X-Ray films and their usage
6. Computer Hardware involved in a Nuclear Medicine setup
7. Steps you would take to improve 'Image Quality'
8. What are the different types of software involved in a Nuclear medicine unit?

III. Short Answers on: **(10 x 3 = 30)**

1. Nyquist Frequency
2. Spatial Resolution
3. Grey scale & Color Display
4. Data Archiving
5. Backup & Restore operations
6. Storage Devices
7. Differences between Conventional & Modern image processing units.
8. Define 'Open Source Architecture'.
9. What are the regular 'Maintenance' procedures that you would employ to ensure that your software & hardware perform effectively?
10. Enumerate the types of Image processing equipment.

[LF 0212]

AUGUST 2014

Sub.Code :2102

**B.SC. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR
PAPER II - IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on: **(3x10 =30)**

1. Define a Computer and its main compartments, input and output devices.
2. Describe the terms-Desktop, File, Software, Folder, Hyperlink, Icon, Input and Internet.
3. Describe Back up and their importance. Briefly mention the various back up Systems.

II. Write Notes on: **(8 x 5 = 40)**

1. Explain the features of PACS.
2. Describe the dry processing of films
3. Mention briefly about windowing in image acquisition
4. What is Voxel and explain briefly
5. What is the difference between attenuation correction and scatter
6. Describe briefly about Time Activity Curves
7. Image co registration
8. Describe briefly about image smoothening

III. Short Answers on: **(10 x 3 = 30)**

1. Line spread function
2. Nyquist frequency
3. Point spread function
4. Surface rendering (3D display)
5. Mention briefly the computer output devices
6. SPECT
7. IP address
8. Data compression
9. Image fusion
10. Image segmentation

[LG 0215]

FEBRUARY 2015

Sub.Code :2102

**B.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR
PAPER II - IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. The film processing systems used in nuclear medicine.
2. The different output devices used in computers in nuclear medicine.
3. The parameters related to optimum viewing of nuclear medicine images.

II. Write Notes on:

(8 x 5 = 40)

1. Dry processing of films.
2. Analog to digital converters.
3. Image contrast.
4. Flat panel monitors.
5. Voxel.
6. Windowing.
7. Grey scale and color display.
8. IP address.

III. Short Answers on:

(10 x 3 = 30)

1. Dry bench in a dark room.
2. Types of X-ray films.
3. List mode acquisition.
4. Hardware.
5. Read-only memory (ROM).
6. Data display
7. Random access memory (RAM).
8. Digital Imaging and Communications in Medicine (DICOM).
9. Key board.
10. Filtered back projection.

[LH 0815]

AUGUST 2015

Sub.Code :2102

**B.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR
PAPER II – IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. Explain the different Soft ware used in Image Processing.
2. Explain the Nuclear Medicine Image Acquisition process.
3. Explain the Data Losses and Data Back-up in computer usage.

II. Write Notes on:

(8 x 5 = 40)

1. Word Processing.
2. Operating System.
3. Spatial Relationship.
4. Image acquisition windowing.
5. Image Filters.
6. Image Quality and Sharpness.
7. Film Structure and quality.
8. Analog Image.

III. Short Answers on:

(10 x 3 = 30)

1. 3D display.
2. IP Address.
3. Line Spread Function.
4. Wet Processing.
5. Image fusion.
6. SPECT.
7. Storage device.
8. Key Board.
9. Digitally Reconstructed image.
10. Film characteristics.

[LI 0216]

FEBRUARY 2016

Sub.Code :2102

**B.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR
PAPER II – IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. Enumerate the computer uses in Nuclear Medicine.
2. Explain the importance of computer peripherals in Image presentation.
3. Explain different Image Analysis applications in Nuclear Medicine.

II. Write Notes on:

(8 x 5 = 40)

1. Color and Grey scale.
2. Word Processing.
3. PACS system.
4. Digitally Reconstructed (DR) Image.
5. Wet processing Image.
6. Different Image storage devices.
7. Use of Radioactive Markers.
8. IP Address.

III. Short Answers on:

(10 x 3 = 30)

1. Image storage in scan format.
2. Viewing Monitors.
3. Image Fusion.
4. CPU.
5. SPECT.
6. 2D Display.
7. Image zooming.
8. Key Board.
9. Image Quality.
10. Computer Peripherals.

[LJ 0816]

AUGUST 2016

Sub.Code :2102

**B.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR
PAPER II – IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. What are the image processing equipment's? Enumerate advantages and disadvantage of each?
2. Describe Back up and their importance. Briefly mention the various backup Systems.
3. What is telemedicine? Explain the role of networking in nuclear medicine.

II. Write Notes on:

(8 x 5 = 40)

1. PACS system.
2. Analog to digital converters.
3. Image filtering.
4. Flat panel monitors.
5. Pixel and Voxel.
6. Windowing.
7. Grey scale and colour display.
8. Matrix size and IP address.

III. Short Answers on:

(10 x 3 = 30)

1. Hardware.
2. Spatial resolution.
3. List mode acquisition.
4. Image fusion.
5. Read-only memory (ROM).
6. Line spread function.
7. Random access memory (RAM).
8. DRI (Digitally Reconstructed Image).
9. Storage devices, mouse and Key board.
10. Filtered back projection.

[LK 0217]

FEBRUARY 2017

Sub.Code :2102

**B.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR
PAPER II – IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. Explain manual film processing.
2. Explain the x ray film components and intensifying screen.
3. Explain the applications of computer in nuclear medicine.

II. Write Notes on:

(8 x 5 = 40)

1. Image Noise.
2. Characteristics of computer.
3. Database.
4. Digital signal processing.
5. Characteristic screen of X ray film.
6. Safe light.
7. Optical density.
8. Hard disk.

III. Short Answers on:

(10 x 3 = 30)

1. Hard Disk.
2. Software's used in nuclear medicine.
3. Gray scale.
4. High pass filter.
5. Automatic Exposure Control.
6. Dry processing.
7. Film speed.
8. Optical Disk.
9. Advantages of Glossy prints.
10. Laser Prints.

[LL 0817]

AUGUST 2017

Sub.Code :2102

**B.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR
PAPER II – IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on: **(3 x 10 = 30)**

1. Explain database package and software's used in nuclear medicine.
2. Explain the manual film processing.
3. Explain Image Noise and Resolution.

II. Write Notes on: **(8 x 5 = 40)**

1. Image sharpness.
2. Characteristics film.
3. X ray film sensitivity.
4. Digital signal processing.
5. Characteristic screen of X ray film.
6. Safe storage of x ray films.
7. Laser film.
8. DVD.

III. Short Answers on: **(10 x 3 = 30)**

1. Hard Disk.
2. Direct exposure films.
3. Gray scale.
4. Image filters.
5. Screen speed.
6. Dry processing.
7. Latent Image.
8. Optical Disk.
9. Fluorescence.
10. Segmentation of images.

[LM 0218]

FEBRUARY 2018

Sub. Code: 2102

**B.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR
PAPER II – IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. Explain the components of image quality.
2. Explain Digital Image processing.
3. Explain manual film processing.

II. Write Notes on:

(8 x 5 = 40)

1. Image Resolution and sharpness.
2. Radioactive markers.
3. Cross section of X ray film.
4. Intensifying screen.
5. Characteristic screen of X ray film.
6. Dark room.
7. Automatic film processor.
8. SMPTE pattern.

III. Short Answers on:

(10 x 3 = 30)

1. Hard Disk.
2. Software's used in nuclear medicine.
3. Colour scale.
4. Low pass filter.
5. Automatic Exposure Control.
6. Optical Density.
7. Film speed.
8. Optical Disk.
9. Advantages of Glossy prints.
10. RAM.

[LN 0818]

AUGUST 2018

Sub. Code: 2102

B.Sc. NUCLEAR MEDICINE TECHNOLOGY

FIRST YEAR

PAPER II – IMAGE PROCESSING TECHNIQUES

Q.P. Code: 802102

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. Explain various steps involved in the manual wet film processing.
2. Explain the working principle of a computer.
3. Describe the terms- Hardware, Software, Operating System, Folder and Internet.

II. Write Notes on:

(8 x 5 = 40)

1. Mention briefly about windowing in image processing.
2. Region of interest (ROI) and time activity curve.
3. Dynamic and Static acquisition.
4. Define Binary numeral system. Convert decimal number 256 into binary.
5. Different types of X-ray films.
6. Output devices of a computer.
7. Analogue to digital converter (ADC).
8. Dry and wet bench in a dark room.

III. Short Answers on:

(10 x 3 = 30)

1. Difference between Bit and Byte.
2. Pixel and Voxel.
3. Compact Disc-Read Only Memory (CD-ROM).
4. Operating system of a computer.
5. Day light processing.
6. Developer.
7. Optical Density.
8. Tele Nuclear Medicine.
9. Internet Protocol (IP) address.
10. Liquid Crystal Display (LCD).

[LO 0219]

FEBRUARY 2019

Sub. Code: 2102

B.Sc. NUCLEAR MEDICINE TECHNOLOGY

FIRST YEAR

PAPER II – IMAGE PROCESSING TECHNIQUES

Q.P. Code: 802102

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. Draw the cross-section of a double coated photographic film and explain the working principle.
2. Why CPU is called the brain of a computer? Explain the role of CPU in a computer.
3. Explain the role of Computers in Nuclear Medicine image acquisition and processing.

II. Write Notes on:

(8 x 5 = 40)

1. Grayscale and Colour Scale.
2. Word and byte acquisition.
3. Various stages of wet film processing
4. Film cassette and image intensifier.
5. Single coated photographic film.
6. Arithmetic Logic Unit (ALU) of a computer.
7. Digital to Analogue converter.
8. Film dryer.

III. Short Answers on:

(10 x 3 = 30)

1. Regular region of interest.
2. Frame activity curve.
3. Static acquisition.
4. Word mode acquisition.
5. Safe lamps in dark room.
6. Composition of Photographic Emulsion.
7. Annihilation layer in the single coated film.
8. Tele reporting.
9. Radioactive markers.
10. Random access memory (RAM).

[LP 0819]

AUGUST 2019

Sub. Code: 2102

B.Sc. NUCLEAR MEDICINE TECHNOLOGY

FIRST YEAR

PAPER II – IMAGE PROCESSING TECHNIQUES

Q.P. Code: 802102

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. Draw the typical layout of a dark room and explain the role of wet and dry bench in film processing.
2. Describe the various input and output devices of a nuclear medicine computer.
3. Explain the advantage and disadvantage of digital imaging.

II. Write Notes on:

(8 x 5 = 40)

1. Upper and lower threshold.
2. Different matrix size used for image acquisition.
3. Pixel and Voxel.
4. Define Binary numeral system. Convert Binary number 1101 to decimal.
5. Flat panel monitors.
6. Computer input devices.
7. Digital to Analogue converter.
8. Automatic film processor.

III. Short Answers on:

(10 x 3 = 30)

1. Irregular region of interest.
2. Time activity curve.
3. Dynamic acquisition.
4. Byte mode acquisition.
5. Read Only Memory (ROM).
6. Composition of a fixer.
7. Fogging of photographic or X-ray film.
8. Point spread function.
9. PASC.
10. DICOM images.

[LQ 0220]

FEBRUARY 2020

Sub. Code: 2102

B.Sc. NUCLEAR MEDICINE TECHNOLOGY

FIRST YEAR

PAPER II – IMAGE PROCESSING TECHNIQUES

Q.P. Code: 802102

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. Enumerate the process involved in image processing.
2. Explain data losses and data backup in computer usage.
3. What is CPU in computer? Write about its components.

II. Write Notes on:

(8 x 5 = 40)

1. Background correction.
2. Matrix size.
3. Image filters.
4. Types of X-ray film and their usage.
5. Image acquisition interface.
6. Surface marking in images.
7. Image contrast.
8. R.A. markers used in imaging.

III. Short Answers on:

(10 x 3 = 30)

1. Key board.
2. Tele radiology.
3. Slice thickness.
4. Word processing.
5. Storage devices.
6. Data archiving.
7. Automatic film processor.
8. PACS.
9. Laser prints.
10. Cathode ray tubes.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0321]

MARCH 2021

Sub. Code: 2102

(AUGUST 2020 EXAM SESSION)

B.Sc. NUCLEAR MEDICINE TECHNOLOGY

FIRST YEAR (Regulations 2010-2011)

PAPER II – IMAGE PROCESSING TECHNIQUES

Q.P. Code : 802102

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Various methods of storage and processing of digital images in Nuclear Medicine.
2. What is CPU in a computer, briefly write about its components?
3. Explain different software used in image processing.

II. Write Notes on:

(8 x 5 = 40)

1. Safe light.
2. Color images and its digital representation.
3. Computer network.
4. PACS.
5. What is the purpose of filtering the image?
6. PIXEL.
7. Day light processing.
8. Flat panel monitors.

III. Short Answers on:

(10 x 3 = 30)

1. Window levels in image display.
2. Bytes.
3. Teleradiology.
4. DICOM.
5. List mode.
6. Point spread function.
7. DICOM.
8. Colour scale.
9. Types of X-ray Films.
10. Frame mode acquisition.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0422]

APRIL 2022

Sub. Code: 2102

(FEBRUARY 2021 & AUGUST 2021 EXAM SESSIONS)

B.Sc. NUCLEAR MEDICINE TECHNOLOGY

FIRST YEAR (Regulations 2010-2011)

PAPER II – IMAGE PROCESSING TECHNIQUES

Q.P NO. 802102

Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on:

(3 x10 = 30)

1. Write in detail about the parameters related to optimum viewing of Nuclear Medicine images.
2. Define a Computer and its main compartments, input and output devices.
3. Describe the terms-Desktop, File, Software, Folder, Hyperlink, Icon, Input and Internet

II. Write Notes on:

(8 x 5 = 40)

1. Optical density.
2. Hard disc.
3. Wet film processing.
4. Computer network.
5. Dynamic and static acquisition.
6. Image artefacts.
7. Region of interest.
8. Image filters.

III. Write Short Notes on:

(10 x 3 = 30)

1. Difference between Bit and Byte.
2. Optical Disk.
3. DRI (Digitally Reconstructed Image).
4. Storage devices, mouse and Key board.
5. Laser Prints.
6. Film characteristics.
7. CPU.
8. 2D Display.
9. Line Spread Function.
10. Types of X-ray films.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1122]

NOVEMBER 2022

Sub. Code: 2102

**B.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR (Regulation 2010-2011)
PAPER II – IMAGE PROCESSING TECHNIQUES
Q.P NO. 802102**

Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on:

(3 x10 = 30)

1. Explain the Nuclear Medicine Image Acquisition process.
2. What is telemedicine? Explain the role of networking in Nuclear Medicine.
3. Explain the Data Losses and Data Back-up in computer usage.

II. Write Notes on:

(8 x 5 = 40)

1. Describe the dry processing of films.
2. Mention briefly about windowing in image.
3. Image contrast.
4. Flat panel monitors.
5. IP address.
6. Grey scale and color display.
7. Types of X-ray films and their usage.
8. Image filtering.

III. Write short notes on:

(10 x 3 = 30)

1. Data Archiving.
2. Radioactive Markers.
3. Enumerate the types of Image processing equipment.
4. Mention briefly the computer output device.
5. Image fusion.
6. Image segmentation.
7. Dry bench in a dark room.
8. Read-Only Memory (ROM).
9. Random Access Memory (RAM).
10. Storage device.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0423]

APRIL 2023

Sub. Code: 2102

**B.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR (Regulations 2010-2011 & 2018-2019 onwards)
PAPER II – IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on:

(3 x10 = 30)

1. Explain Nuclear Medicine Image Acquisition Process.
2. Explain the X-ray film components and intensifying screen.
3. Describe the film processing systems used in Nuclear Medicine.

II. Write Notes on:

(8 x 5 = 40)

1. Image co registration.
2. Matrix size.
3. Describe briefly about image smoothening.
4. PACS.
5. Word processing.
6. Image noise.
7. Data base.
8. Safe light.

III. Write Short Notes on:

(10 x 3 = 30)

1. Point spread function.
2. Computer Peripherals.
3. List mode acquisition.
4. Automatic Exposure Control.
5. Advantages of Glossy prints.
6. Image zooming.
7. Liquid Crystal Display (LCD).
8. Composition of Photographic Emulsion.
9. Radioactive markers.
10. Day light processing.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1123]

NOVEMBER 2023

Sub. Code: 2102

**B.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR (Regulations 2010-2011 & 2018-2019 onwards)
PAPER II – IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on:

(3 x10 = 30)

1. What is central processing unit in a computer? Briefly write about its components.
2. What are the image processing Equipments? Enumerate advantages and disadvantages of each.
3. What are backups and why are they important? What are the methods available for performing backup and which is the best?

II. Write Notes on:

(8 x 5 = 40)

1. Image sharpness.
2. Laser film.
3. Softwares for Myocardial Perfusion Imaging.
4. Digital signal processing.
5. Artificial Intelligence (AI) in Image processing.
6. Hard disc.
7. Image noise.
8. Optical density.

III. Write Short Notes on:

(10 x 3 = 30)

1. Differences between bit and byte.
2. Image Zooming.
3. Types of X-ray films.
4. Optical disc.
5. Storage device, mouse and key board.
6. Hard disc.
7. Automatic exposure control.
8. High pass filter.
9. Dry processing.
10. Laser prints.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0424]

APRIL 2024

Sub. Code: 2102

**B.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR (Regulations 2010-2011 & 2018-2019 onwards)
PAPER II – IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three Hours

Answer All questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. The various methods of storage and processing of digital images in Nuclear Medicine.
2. Parameters related to optimum viewing of Nuclear Medicine Images.
3. Describe the various types of X-ray films and Basic film structure.

II. Write Notes on:

(8 x 5 = 40)

1. Data base.
2. PACS.
3. Flat panel detector.
4. Analog to digital converters.
5. Windowing.
6. Operating resolution.
7. Spatial relationship.
8. Dry processing of films.

III. Short Answers on:

(10 x 3 = 30)

1. Softwares used in Nuclear Medicine.
2. Film speed.
3. Advantages of Glossy prints.
4. List mode acquisition.
5. Spatial resolution.
6. Line spread function.
7. Filtered back projection.
8. Image fusion.
9. Random access memory.
10. IP address.

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

[AHS 1125]

NOVEMBER 2025

Sub. Code: 2102

**B.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR (Regulations 2010-2011 & 2018-2019 onwards)
PAPER II – IMAGE PROCESSING TECHNIQUES**

Q.P. Code: 802102

Time: Three Hours

Answer All questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Explain the Data losses and Data backup in computer usage.
2. Explain the Nuclear medicine acquisition process.
3. Elaborate on the parameters related to optimum viewing of NM images.

II. Write notes on:

(8 x 5 = 40)

1. What is the difference between scatter and attenuation correction?
2. Wet film processing.
3. Ideal settings for image viewing.
4. Operating systems.
5. Flat panel monitors.
6. Day light processing.
7. Contrast enhancement.
8. Cathode ray tube.

III. Short answers on:

(10 x 3 = 30)

1. Digitally reconstructed image.
2. 3D display.
3. Frame mode.
4. Storage devices, mouse and key board.
5. Hard disc.
6. Automatic exposure control.
7. Film speed.
8. Advantages of glossy prints.
9. Image segmentation.
10. Laser prints.
