Question Paper

Exam Date & Time: 23-May-2024 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc. NMT DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: NMT3202 - CLINICAL NUCLEAR MEDICINE - II
(2020 SCHEME)

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1)	Explain how multi-gated acquisition is used to assess cardiac function? Describe the imaging procedure and scan interpretation criteria. (5+10+5 = 20 marks)	(20)
2)	Draw a labelled diagram for blood brain barrier (BBB). What are the clinical conditions in which the BBB could be disrupted? Describe how the integrity of BBB could be checked using radionuclide imaging technique. (5+5+10 = 20 marks)	(20)
3)	Compare properties of radio-pharmaceuticals used for myocardial perfusion imaging	(10)
4)	Discuss the rationale and radionuclide imaging procedure used to assess renal function	(10)
5A)	Explain the uptake mechanism for any two brain specific radio-pharmaceuticals	(5)
5B)	Briefly explain how radionuclide scan can be used to measure Glomerular filtration rate.	(5)
5C)	Describe the pathophysiology of Parkinson's disease	(5)
5D)	Outline the procedure for patient preparation for brain perfusion scan in a patient with dementia.	(5)
5E)	Diagrammatically show CSF flow in non-communicating hydrocephalous.	(5)
5F)	Briefly outline cardiac perfusion changes in physiological rest and stress state	(5)
6A)	Give two clinical indications for ^{99m}Tc-DTPA in brain scan	(2)
6B)	What are the advantages of using ^{99m}Tc-HMPAO over ^{99m}Tc-ECD for brain perfusion imaging?	(2)
6C)	Name any two PET radiopharmaceuticals used for dementia imaging	(2)
6D)	What are polar maps obtained from cardiac scans?	(2)
6E)	What is captopril used for in renogram study?	(2)

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Question Paper

Exam Date & Time: 25-May-2024 (10:00 AM - 12:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc. NMT DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: NMT3241 - PROGRAM ELECTIE - II PRINCIPLES AND TECHNIQUES IN RADIOPHARMACEUTICAL DEVELOPMENT
(2020 SCHEME)

Marks: 50 **Duration: 120 mins.**

Answer all the questions.

1)	Describe the nucleophilic & electrophilic method of F-18 FDG labelling.	(10)
2)	Describe the evolution in design & functioning of 99mTc-column radionuclide generators over the past years. Support your answer with labelled diagram as & where required.	(10)
3A)	Write a note on solid and liquid targets used in medical cyclotron.	(5)
3B)	Explain role of spectroscopy in drug design & development.	(5)
3C)	Describe the Lu-177 PSMA radiolabelling.	(5)
3D)	What is computer-aided drug design and its role in drug development?	(5)
4A)	Explain principle used in organic solvent extraction process in separation of 99mTc from 99Mo.	(2)
4B)	Differentiate between negative ion & positive ion cyclotron.	(2)
4C)	Which type of reaction is involved in Lu-177 DOTATATE synthesis?	(2)
4D)	Which method is used for toxicity evaluation in drug development process?	(2)
4E)	How electron microscope is used for drug design & development?	(2)

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Question Paper

Exam Date & Time: 25-May-2024 (10:00 AM - 12:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc. NMT DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: NMT3242 - PROGRAM ELECTIVE - II : PRINCIPLES AND TECHNIQUES IN NUCLEAR MEDICINE IMAGE ANALYSIS
(2020 SCHEME)

Marks: 50 **Duration: 120 mins.**

Answer all the questions.

1)	Explain in detail the requirement and types of conjugate imaging in Nuclear Medicine.	(10)
2)	In detail explain on the various image filters used in Nuclear Medicine.	(10)
3A)	Write short note on image registration adopted in hybrid imaging of Nuclear Medicine.	(5)
3B)	What is the role of Gamma Camera Interface in digital images? With reason state is it an essential device in Nuclear Medicine?	(5)
3C)	How digital images are generated during a dynamic scan?	(5)
3D)	Write short note on curve arithmetics and its applications.	(5)
4A)	What is time activity curve?	(2)
4B)	A gamma scanner has 440mm field of view and FWHM value of 0.8cm. Which matrix size needs to be used for a dynamic scan?	(2)
4C)	What is surface rendering?	(2)
4D)	List any two analogue to digital converters.	(2)
4E)	Is image subtraction a useful feature in Nuclear Medicine image display? Justify your answer with suitable example.	(2)

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