Question Paper

Exam Date & Time: 30-May-2024 (10:00 AM - 12:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER BPT/BOT/B.Sc. (ESS/ RRT & DT / RT / MIT) / FOURTH SEMESTER B.Sc. (PFT / CVT / CND / MLT / HIM / BOPT / BAOTT / RT / EMT / PHYSICIAN ASSISTANT / PSYCHOLOGY / NMT) / EIGHT SEMESTER (BPT / BOT) / SECOND SEMESTER BASLP DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: BST3201 / STAT 402 / BST 3202 - BIOSTATISTICS AND RESEARCH METHODOLOGY / BIOSTATISTICS / BASIC BIOSTATISTICS AND RESEARCH METHODOLOGY
(2016/2020/2022 SCHEME)

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

Answer all the questions.

1A)	Elaborate graphical representation with examples.	(5)
1B)	Explain the properties of normal distribution with diagram.	(5)
2A)	Describe different types of clinical study designs.	(5)
2B)	Write short notes on non-probability sampling.	(5)
3A)	The triglycerides (serum) (in mg/dL) of 10 patients were as follows: 155, 150, 106, 89, 63, 68, 144, 125, 130, 74 Calculate mean, and standard for the above data.	(5)
3B)	Define the following: (i) Incidence rate (ii) prevalence rate.	(5)
3C)	Discuss about regression analysis and its two equations.	(5)
3D)	Write short notes on research process.	(5)
4A)	Define skewness.	(2)
4B)	The following are the weights for 10 patients. Calculate range and mode 60, 54, 74, 82, 59, 63, 72, 89, 58, 85.	(2)
4C)	What is meant by systematic sampling?	(2)
4D)	Define scatter plot.	(2)
4E)	Define case report.	(2)

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Question Paper

Exam Date & Time: 28-May-2024 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

FOURTH SEMESTER B.Sc. NMT DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: NMT2201 - RADIOBIOLOGY
(2020 SCHEME)

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

Answer all the questions.

1)	What are survival curves and how are they generated? Compare the curve characteristics for cells exposed to radiations in different phases of cell cycle. (10+10 = 20 marks)	(20)
2)	Describe deterministic effects of acute radiation exposure on human body.	(20)
3)	Discuss mechanism of radiation induced DNA damage.	(10)
4)	Explain the difference between apoptosis and necrosis.	(10)
5A)	Write a short note on DNA repair mechanism.	(5)
5B)	Discuss models for calculating cancer risk estimates.	(5)
5C)	Write a note on oxygen effect and its relationship with radiobiological effectiveness.	(5)
5D)	Differentiate between radiosensitizers and radioprotectors.	(5)
5E)	Diagrammatically show different type of chromosomal aberrations.	(5)
5F)	Write short note on micronucleus.	(5)
6A)	What is the difference between stochastic and non-stochastic radiation effects?	(2)
6B)	What are free radicals?	(2)
6C)	What is the difference between a zygote and an embryo?	(2)
6D)	What is LD 50 value for humans?	(2)
6E)	Name an antioxidant.	(2)

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Question Paper

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

MANIPAL ACADEMY OF HIGHER EDUCATION

FOURTH SEMESTER B.Sc. NMT DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: NMT2202 - HEALTH PHYSICS
(2020 SCHEME)

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

Answer all the questions.

1)	Write briefly about the steps to be taken if there is a spillage of radioactive material in a radioisotope lab	(20)
2)	What are the aims of Radiation Protection? Explain the system of radiological protection. Mention the recommended dose limits for both occupational workers and public?	(20)
3)	Write in detail about various personnel monitoring devices used for monitoring radiation workers	(10)
4)	Write in detail about the classical method of beta and gamma internal dosimetry.	(10)
5A)	Explain Equivalent Dose and Effective Dose	(5)
5B)	How to handle I-131 administered cadaver?	(5)
5C)	Define transport index? How packages are classified for the transport of radioactive materials?	(5)
5D)	Define Half Value Layer and Tenth Value Layer and derive the relationship between them	(5)
5E)	List the three general approaches for dealing with radioactive waste. Give a practical example in each case.	(5)
5F)	Explain patient monitoring and discharging criteria for a I-131 therapy patients	(5)
6A)	Define ALARA	(2)
6B)	What is the meaning of radiation spillage?	(2)
6C)	Define absorbed dose	(2)
6D)	What is the meaning of contamination?	(2)
6E)	Write about film dosimeters	(2)

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Question Paper

Exam Date & Time: 03-Jun-2024 (10:00 AM - 12:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

FOURTH SEMESTER B.Sc. NMT DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: NMT2241 - PROGRAM ELECTIVE - I : NON-IMAGING NUCLEAR MEDIICNE TECHNIQUES
(2020 SCHEME)

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

Answer all the questions.

1)	Describe patient's thyroid uptake measurement in detail.	(10)
2)	Illustrate the Schilling test used to assess if a patient had a vitamin deficiency.	(10)
3A)	If the patient had an iron deficit, which nuclear medicine test would be recommended and why?	(5)
3B)	Describe how plasma volume is estimated in nuclear medicine.	(5)
3C)	List the materials needed for the urea breath test and explain how the sample is collected.	(5)
3D)	Explain the construction and operation of the sentinel node detection probe.	(5)
4A)	To make 100 ml of the solution A (100 mg/dl) from solution B (500 mg/dl), what volume of solution B should be used?	(2)
4B)	Write the RBC morphology.	(2)
4C)	List the four main benefits of the red cell survival study.	(2)
4D)	Where must the patients be positioned in order to study spleen sequestration?	(2)
4E)	List the physical attributes of the radiopharmaceuticals that are utilized in the GFR study.	(2)

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Question Paper

Exam Date & Time: 03-Jun-2024 (10:00 AM - 12:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

FOURTH SEMESTER B.Sc. NMT DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: NMT2242 - PROGRAM ELECTIVE - I : RADIOIMMUNOLOGY
(2020 SCHEME)

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

Answer all the questions.

1)	What are the different types of immunity? Elaborate on components of innate and acquired immunity (3+7 = 10 marks)	(10)
2)	Explain antigen antibody interactions. Differentiate between monoclonal and polyclonal antibodies (5+5 = 10 marks)	(10)
3A)	Draw and label antibody structure	(5)
3B)	Outline principle of radioimmunoassay	(5)
3C)	Outline the principle of agglutination inhibition assay	(5)
3D)	Discuss the role of different immunoglobins in immune response	(5)
4A)	Give example of an autoimmune disease	(2)
4B)	Which cells produce antibodies?	(2)
4C)	Which out of primary and secondary antibody is more specific?	(2)
4D)	T cell development occurs in which organ?	(2)
4E)	Name a reticuloendothelial tissue	(2)

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