

Question Paper

Exam Date & Time: 02-May-2019 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal Academy of Higher Education, Manipal MPharm Theory End-Semester Examinations.
MPharm - Pharmaceutical Biotechnology Specialization
MPharm Semester 2 - End-Semester Examination May-2019

Date : 02/05/2019

Proteins and Protein Formulations [PBT-MPB201T]

Duration: 180 mins.

Marks: 75

SECTION - A

Answer all the questions.

Answer the following (10 marks x 5 = 50 marks)

- 1) Proteins can have maximum of four levels of structure. Discuss the structure of proteins. (10)
- 2) Electrophoresis is a frequently used technique for analysis of proteins. Explain the principle and applications of SDS-PAGE, 2D gel and iso-electric focusing techniques. (10)
- 3) Enlist the potential degradation pathways of proteins and elaborate on analytical methods as a requirement in preformulation studies. (10)
- 4) Explain various factors to be considered in the formulation development of a biopharmaceutical. (10)
- 5) Discuss immunogenicity studies as a requirement in the development of biosimilars. (10)

SECTION - B

Answer all the questions.

Answer the following (5 marks x 5 = 25 marks)

- 6) Explain Edman degradation technique of protein sequencing. (5)
- 7) Explain the principle and advantages of liquid-liquid extraction technique in protein purification. (5)
- 8) What is peptidomimetics? Explain the advantages of using peptide therapeutics over other therapeutic modules. (5)
- 9) Write a note on novel formulation approaches for protein pharmaceuticals. (5)
- 10) Briefly discuss the analytical studies for structural characterization of biosimilars. (5)

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Question Paper

Exam Date & Time: 04-May-2019 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal Academy of Higher Education, Manipal MPharm Theory End-Semester Examinations.
MPharm - Pharmaceutical Biotechnology Specialization
MPharm Semester II - End Semester Examination, May, 2019

Date : 04/05/2019

Immunotechnology [PBT-MPB202T]

Marks: 75

Duration: 180 mins.

SECTION - A

Answer all the questions.

Answer the following (10 marks x 5 = 50 marks)

- 1.) Differentiate humoral from cell mediated immunity. Elaborate on the different types of T cells. (10)
- 2.) What is autoimmunity? Classify autoimmune diseases and write briefly on them. Add a note on primary and secondary immunodeficiency. (10)
- 3.) Draw a comparison of innate immunity with adaptive immunity and through schematic representation, describe the process of hematopoiesis. (10)
- 4.) Indicate, the steps in sequence, for a bacterium to be phagocytosed and discuss the mechanisms of killing of phagocytosed microbes. (10)
- 5.) Discuss vaccines as under:
Definition, types, historical perspective, adjuvants and mode of action. (10)

SECTION - B

Answer all the questions.

Answer the following (5 marks x 5 = 25 marks)

- 1.) Outline the various steps to be considered for developing an effective vaccine. (5)
- 2.) Define the terms epitope and paratope. Explain the basis of monoclonal antibody production by hybridoma technology. (5)
- 3.) Enlist the classes of immunoglobulins and write short notes on any two. (5)
- 4.) What is autoimmunity? Write short notes on systemic autoimmune disease. (5)
- 5.) Differentiate ELISA from RIA. (5)

- End -

Question Paper

Date & Time: 06-May-2019 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal Academy of Higher Education, Manipal MPharm Theory End-Semester Examinations.
MPharm - Pharmaceutical Biotechnology Specialization
MPharm Semester 2 - End-Semester Examination May-2019
Date : 06/05/2019

Bioinformatics and Computational Biotechnology [PBT-MPB203T]

Marks: 75

Duration: 180 mins.

SECTION - A

Answer all the questions.

Answer the following (10 marks x 5 = 50 marks)

- 1) Discuss the enzymology of DNA replication. Add a note on conservative and semiconservative mode of replication. (10)
- 2) What is MPF, explain its structure and functions. How it is oscillating in a cell division cycle?. (10)
- 3) What are Caspases, classify them. How they are activated? Explain the importance of BCL-2 family proteins in apoptosis. (10)
- 4) What are substitution matrices? Discuss the various types of substitution matrices. Explain in detail the steps involved in global alignment of two sequences using dynamic programming. (10)
- 5) Explain the different steps involved in rational drug design for Hit identification. Describe in detail Hit-to-Lead identification. How do you predict the ADME properties? (10)

SECTION - B

Answer all the questions.

Answer the following (5 marks x 5 = 25 marks)

- 6) What are spontaneous mutations? How they are repaired? (5)
- 7) Briefly outline the hallmarks of cancer. (5)
- 8) Briefly outline the role of cGMP and Ca²⁺ as second messengers. (5)
- 9) Define the terms "Data", "Information", and "Knowledge". List the different supervised and unsupervised machine learning methods. (5)
- 10) How do you validate a protein structure predicted through homology modeling? (5)

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Question Paper

Date & Time: 08-May-2019 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal Academy of Higher Education, Manipal MPharm Theory End-Semester Examinations.

MPharm - Pharmaceutical Biotechnology

MPharm Semester II - End Semester Examination, May 2019

Date : 08/05/2019

Biological Evaluation of Drug Therapy [PBT-MPB204T]

Marks: 75

Duration: 180 mins.

SECTION - A

Answer all the questions.

Answer the following (10 marks x 5 = 50 marks)

- 1) Discuss pyrogens as under: physiological effects of pyrogens; sources; LAL test; limitations of rabbit pyrogen test. (10)
- 2) Describe Erythropoietin(EPO) with respect to its functions, regulation of its production and therapeutic applications. (10)
- 3) Enlist the various competent authorities involved in the approval process for a similar biologic and describe the studies needed for its characterization. (10)
- 4) Describe the objectives, steps involved and parameters used in acute and chronic toxicity tests. (10)
- 5) Explain the factors which increase bioavailability of proteinaceous drugs (10)

SECTION - B

Answer all the questions.

Answer the following (5 marks x 5 = 25 marks)

- 6) Briefly outline the salient features of Class I BCS and Class II BCS products. (5)
- 7) Define the following as per the guidelines on similar biologics: Genetic Engineering; Drug substance; Immunogenicity. (5)
- 8) Briefly explain: Teratogenicity, LD50 and ED50. (5)
- 9) Write briefly on clinical significance of protein based contaminants. (5)
- 10) Write a note on importance of pharmacokinetic models. (5)

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