Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: MICROBIAL BIOCHEMISTRY AND IMMUNOLOGY (PBT 601)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Monday, May 27, 2013

Time: 10:00 – 13:00 Hrs. Max. Marks: 100

✍ **Answer ALL the questions.**

1A. Enlist and classify the various counting techniques used to estimate the bacterial count. Elaborate on the statistical approach.

1B. With the help of a neat labelled diagram, explain the lysogenic cycle in bacteriophages. Add a note on its significance.

(10+10 = 20 marks)

2A. Sketch the *De novo* pathway for the synthesis of pyrimidine ribonucleotides. Add a note on contributors of each atom of the pyrimidine ring.

2B. Define β-oxidation. Explain in detail β-oxidation of palmitic acid with a note on its energetics.

(10+10 = 20 marks)

3A. With a neat labelled diagram, describe the structure of an antibody.

3B. What is TCR-CD3 complex? Emphasize the role of co-receptors in TCR binding affinity.

(10+10 = 20 marks)

4A. What is cancer immunotherapy? Explain the different ways of enhancing immunity against cancer.

4B. Explain in detail the principle and instrumentation of immunoblotting. Add a note on its applications.

(10+10 = 20 marks)

5A. Briefly explain electron transport chain and oxidative phosphorylation.

5B. Innate immunity collaborates with adaptive immunity to protect the host. Brief on this naming key points of interactions.

5C. Briefly explain the role of complement system in immunity.

5D. Enlist the different hypersensitive reactions and explain any one.

(5+5+5+5 = 20 marks)

Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: BIOPROCESS ENGINEERING AND TECHNOLOGY (PBT 602)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Wednesday, May 29, 2013

Time: 10:00 – 13:00 Hrs. Max. Marks: 100

Answer all the questions. Draw neat labeled diagram wherever necessary.

1A. Discuss the basic functions of a fermenter and identify the most critical functions.

1B. In establishing continuous culture under steady state conditions, specific growth rate, μ equals to dilution rate, D. Prove it. Compare batch culture with continuous culture for biomass productivity.

(10+10 = 20 marks)

2A. Enlist the mechanisms of filtration. Discuss the Humphrey-Gaden approach of depth filtration.

2B. Explain the Scale down approach to overcome the difficulties of Scale-up.

(10+10 = 20 marks)

3A. What is counter-current extraction? Describe the construction and working of Podbielniak extractor.

3B. Differentiate precipitation process from crystallization and explain Mier's supersaturation theory.

(10+10 = 20 marks)

4A. Why are homofermentative microorganisms preferred to heterofermentative organisms for production of Lactic acid? Explain the recovery process of Lactic acid from fermented broth.

4B. Explain the production of Streptomycin.

(10+10 = 20 marks)

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

5A. Purpose and types of valves and selection criteria

5B. Waldhof type fermenter

5C. Various strain improvement techniques and role of recombinant DNA technology

5D. Criteria of production medium in industrial fermentations

(5×4 = 20 marks)

Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: MODERN PHARMACEUTICAL BIOTECHNOLOGY (PBT 603)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Friday, May 31, 2013

Time: 10:00 – 13:00 Hrs. Max. Marks: 100

Answer ALL questions.

1A. Define recombinant DNA technology and enlist the major steps involved. Explain in detail the role of bacteriophages, YAC and BAC vectors in rDNA technology.

1B. Discuss the production of recombinant insulin with critical comments on pro insulin and colony selection.

(10+10 = 20 marks)

2A. Discuss the vaccine design strategies in relation to immune response.

2B. Discuss the development of genetically modified live vaccines for Bacillus antracis infection.

(10+10 = 20 marks)

3A. Define microarray technology. Explain the different probe-target hybridization and detection techniques.

3B. Define Pharmacogenomics and Pharmacogenetics. Explain drug polymorphisms with emphasis on Drug Metabolising Enzymes (DME) and Single nucleotide polymorphism (SNP).

(10+10 = 20 marks)

4A. Explain in detail induced pluripotent stem cells and their applications.

4B. Enlist different materials used for the manufacture of microfluidic components and explain any two. Add a note on the advantages of microfluidic devices.

(10+10 = 20 marks)

5A. What are the advantages of microorganisms over plants and animals for the production of enzymes? Explain in detail the various parameters involved in the selection of enzyme source.

5B. Write a short note on therapeutic applications of enzymes.

5C. Discuss Algorithms and Data Mining Tools.

(10+5+5 = 20 marks)

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MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: MOLECULAR BIOLOGY AND DRUG DISCOVERY (PBT 604)
(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Monday, June 03, 2013

Time: 10:00 – 13:00 Hrs. Max. Marks: 100

✍ **Answer ALL the questions.**

1A. Explain the role of RNA polymerase in transcription with a note on pribnow box, downstream bases and -35 sequences.

1B. Enlist different types of gene regulation. Explain *Lac* operon model .

(10+10 = 20 marks)

2A. Explain the general process of cell signaling; add a note with suitable examples on various messengers taking part in signaling.

2B. How does an oncogene differ from a tumour suppressor gene? With suitable examples, explain how they can lead to development of cancer.

(10+10 = 20 marks)

3A. With the advancement of molecular biology, the approach for discovery of drugs, especially biopharmaceuticals, has taken new strides. Discuss with special emphasis on genomics.

3B. *In-silico* approach for drug design, preceding drug discovery, would lessen the efforts in wet lab. Explain. Oral delivery of biopharmaceuticals, though the most preferred route is problematic. Why?

(10+10 = 20 marks)

4A. Enumerate various sources of biopharmaceuticals and discuss the advantages and limitations of *E. coli* as a source of recombinant therapeutic proteins.

4B. Define cytokines and give an account of generalizations with regard to cytokines.

(10+10 = 20 marks)

5A. Write a short note on histones.

5B. Mention the various phases in a normal mammalian cell cycle, emphasizing on biochemical changes during various phases with the aid of suitable illustrations.

5C. How does MPF regulate early mitotic events such as chromatin condensation and breakdown of nuclear envelope?

5D. Define gene therapy and discuss germ line therapy.

(5+5+5+5 = 20 marks