Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2012

SUBJECT: MICROBIAL BIOCHEMISTRY AND IMMUNOLOGY (PBT 601)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Saturday, May 26, 2012

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

Answer all the questions.

1A. Explain how the growth of bacterial cells takes place over time and discuss the significance of each phase. Add a note on generation time.

1B. Sketch the lifecycle of a fungi belonging to class Zygomycetes. Add a note on various sexual spores of fungi.

(10+10 = 20 marks)

2A. Explain the phosphorylation steps in EMP and chemiosmotic mechanism of ATP generation. Add a note on splitting phase.

2B. Explain in detail β-oxidation of palmitic acid with respect to

i) Activation
ii) Carnitine shuttle system
iii) β- Oxidation proper
iv) Energetics

(10+10 = 20 marks)

3A. The ability of immunoglobulins to react with a wide variety of antigens is due to diversity. Discuss.

3B. With schematic diagrams, describe the structure of major histocompatibility complexes.

(10+10 = 20 marks)

4A. Describe the specific and non-specific defence mechanisms of immune system against pathogen.

4B. Explain the production of monoclonal antibodies by hybridoma technology, and enlist their applications.

(10+10 = 20 marks)

5A. Show how various purine and pyrimidine ribunucleotides are synthesized in Salvage pathway.

5B. T helper cells play a central role in immunity. Justify.

5C. Briefly explain the process of inflammation and its importance in immunity.

5D. Mention the principle and applications of flow cytometry.

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

Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2012

SUBJECT: BIOPROCESS ENGINEERING AND TECHNOLOGY (PBT 602)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Tuesday, May 29, 2012

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

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

1A. Draw a neat labeled diagram of an Industrial fermenter and discuss temperature control.

1B. Discuss the selection procedures for induced mutants producing improved levels of primary metabolites.

(10+10 = 20 marks)

2A. What are gassing out techniques? Discuss dynamic gassing out technique.

2B. What is Del factor? Discuss its application for designing LTHT and HTST sterilization regimes.

(10+10 = 20 marks)

3A. What are the factors governing extraction of drugs from biological sources? Describe the construction and working of a counter current extractor.

3B. Compare and contrast precipitation and crystallization processes.

(10+10 = 20 marks)

4A. Discuss the production and recovery of Penicillin G.

4B. Explain the fermentative production of riboflavin.

(10+10 = 20 marks)

5. Write short notes on the following:

5A. Butterfly Valves and Pinch Valves.

5B. pH measurement in fermentation broths.

5C. Development of inocula for bacterial processes.

5D. Factors influencing the choice of carbon source for fermentation media.

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

Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2012

SUBJECT: MODERN PHARMACEUTICAL BIOTECHNOLOGY (PBT 603)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Thursday, May 31, 2012

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

Answer all the questions.

1A. Discuss the production of recombinant insulin with critical comments on pro insulin and chimeric proteins.

1B. Define recombinant DNA technology and enlist the major steps involved. Explain the synthesis of cDNA in detail and use of alkaline phosphatase to increase the yield of recombinant molecules.

(10+10 = 20 marks)

2A. Discuss pharmaceutical considerations for the successful development and increase in shelf life of a novel vaccine candidate.

2B. Define DNA vaccines. Outline the development of a DNA vaccine.

(10+10 = 20 marks)

3A. Explain important updates in the field of Pharmacogenomics with a note on quantitative trait loci mapping (QTL) and Drug metabolizing enzymes (DME) and individual risk of cancer and toxicity.

3B. Discuss Sanger's method for Gene sequencing and its importance in Human genome project.

(10+10 = 20 marks)

4A. What are stem cells? Explain the unique properties of stem cells and difference between embryonic stem cells and adult stem cells.

4B. Explain microbial Nano particle production in detail with examples.

(10+10 = 20 marks)

5A. Differentiate between endo and exo enzyme. Discuss in detail the various methods involved in the extraction of an endo enzyme.

5B. Explain the effect of temperature on enzyme activity.

5C. Discuss about sequence alignment with examples.

(10+5+5 = 20 marks)

Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2012

SUBJECT: MOLECULAR BIOLOGY AND DRUG DISCOVERY (PBT 604)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Saturday, June 02, 2012

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

1A. Discuss the post transcriptional modifications in eukaryotic mRNA.

1B. Define gene expression, gene regulation, genotype and phenotype.

(10+10 = 20 marks)

2A. What are G proteins, explain how they associate in signaling process, with emphasis on

i) Structure

ii) Mechanism of activation and inactivation

iii) Specificity

2B. Discuss the activation and degradation of MPF. Add a note on its important functions.

(10+10 = 20 marks)

3A. Discuss issues, advantages and applications with respect to pulmonary delivery of biopharmaceuticals.

3B. What is a patent? What are the criteria to be satisfied by a patentable invention? Enlist the types of patents.

(10+10 = 20 marks)

4A. Describe the role of mammalian cell culture systems in the production of biopharmaceuticals.

4B. Discuss the role of IL-2 in cancer treatment.

(10+10 = 20 marks)

5A. Mention DNA repairing mechanisms in eukaryotes.

5B. Discuss briefly the different check points in normal mammalian cell division cycle.

5C. Compare the apoptotic pathway in vertebrates with that of *C. elegans.*

5D. Compare somatic and germ line gene therapies.

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