Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2011

SUBJECT: INDUSTRIAL MICROBIOLOGY (PBT 601)
(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Thursday, May 26, 2011

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

✍ **Answer all the questions.**

1A. Describe classical characteristics helpful in taxonomy with relevant examples.

1B. Draw neat labeled diagram of a typical bacterial cell and discuss cell wall in detail.

(10+10 = 20 marks)

2A. Enlist any four important characteristics of viruses and their methods of cultivation. Discuss cell culture method of virus cultivation in detail.

2B. Explain the morphological features of molds.

2C. Explain the principle and procedure in phase contrast microscope and its application.

(10+5+5 = 20 marks)

3A. Define screening and differentiate primary screening from secondary screening. Explain the criteria to be considered in the choice of organism to be isolated.

3B. Discuss the selection procedures for induced mutants producing improved levels of primary metabolites.

(10+10 = 20 marks)

4A. Discuss the production of Acetone- Butanol.

4B. Microbial enzyme application in areas *viz.,* industry, medicine etc., has improved due to development in some areas- Discuss. And add a brief note on bacterial α-amylase.

(10+10 = 20 marks)

5A. Represent schematically different types of flagellar arrangement among bacteria. Add a brief note on mechanism of motility.

5B. Outline the general characteristics of rickettsiae and name the pathogens and diseases caused by them.

5C. In the production of lactic acid, *Lactobacillus* bacteria are preferred to *Leuconostoc mesenteroids.* Why? Add a note on recovery of lactic acid from fermented broth.

5D. Enumerate any five different chemical reactions brought out during microbial transformations with examples.

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

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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2011

SUBJECT: BIOPROCESS ENGINEERING (PBT 602)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Saturday, May 28, 2011

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

Answer all questions.

1A. Identify the structural components of a fermenter for aeration and agitation and discuss impellers.

1B. Discuss Tower fermenter. Enlist the other types of fermenters.

(10+10 = 20 marks)

2A. Illustrate the resistances for oxygen transfer across an air bubble to cytosol. Add a note on the relationship of power consumption and K_La.

2B. What are the criteria used in inoculum development? Add a note on inoculum development of yeast processes.

(10+10 = 20 marks)

3A. What is Darcy's law of filtration? Explain the construction and working of a Plate and Frame filter Press.

3B. Explain the methods used for Protein precipitation.

(10+10 = 20 marks)

4A. Differentiate between dialysis and reverse osmosis and discuss the applications of the same.

4B. Explain 'scale up window'. Discuss the ways of overcoming scale up problems using scale down methods.

(10+10 = 20 marks)

5. Write short notes on:

5A. Plug and ball valves.

5B. Sensors.

5C. Del factor and media sterilization.

5D. Drying Curve.

(5×4 = 20 marks)

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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2011

SUBJECT: MODERN PHARMACEUTICAL BIOTECHNOLOGY (PBT 603)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Tuesday, May 31, 2011

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

✍ **Answer all the questions.**

1A. Explain the important features of DNA vaccines and discuss the different DNA vaccine delivery systems and mention the adjuvants for DNA vaccine.

1B. Explain characteristic features of genetically modified live vaccines and add a note on genetically modified live vaccines for Listerial infection.

(10+10 = 20 marks)

2A. With a suitable example, explain the expression of a mammalian gene in a prokaryotic cell for the production of therapeutic proteins.

2B. Discuss the role of plasmids and cosmids as cloning vectors.

(10+10 = 20 marks)

3A. Discuss the effect of pH, temperature and ionic concentration on enzyme activity.

3B. Write a note on industrial applications of biocatalysts.

(10+10 = 20 marks)

4A. With reference to Human Genome project, write applications, advantages and disadvantages. Add a note on Automated DNA sequencer working principle.

4B. Explain the principle and procedure involved in fluorescence immunoassay and fluorescence polarization immunoassay (FPIA).

(10+10 = 20 marks)

5A. Discuss in brief various Data Mining tools.

5B. Write a note on DICER and RISC-RNA induced silencing complex.

5C. Give a brief account on primary and continuous cell cultures, mentioning their advantages and disadvantages.

(10+5+5 = 20 marks)

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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2011

SUBJECT: MOLECULAR BIOLOGY AND IMMUNOLOGY (PBT 604)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Thursday, June 02, 2011

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

Answer all the questions.

1A. Define the terms feedback inhibition, negative regulation and positive regulation. Write a note on the different enzymes involved in the *lac operon* model, their importance and the effect of glucose on the *lac operon* model.

1B. Explain how cAMP and Ca^{2+} act as second messengers.

(10+10 = 20 marks)

2A. Explain the various regulatory check points in cell cycle.

2B. What are tumor suppressor genes? With any two suitable examples, explain how they can cause tumor.

(10+10 = 20 marks)

3A. Schematically represent the structure of immunoglobulin and mention the different classes of immunoglobulins. Explain their specific roles in immunity.

3B. Enlist the different molecules needed to activate T cells and explain briefly the process of activation of T cells.

(10+10 = 20 marks)

4A. What are inflammatory cells? Explain the process of inflammation and its importance in immunity.

4B. Explain the principle and methodology of any two assays for the determination of cytotoxicity

(10+10 = 20 marks)

5A. Explain the various stages in the formation of chromosome, with reference to the Solenoidal model, nucleosomes, centromeres and telomeres. Add a note on the different forms of DNA. With respect to the gene cytogenetic location, mention the following

i) Xp ii) 12pCen iii) 17qTer iv) 19q13.3-q13.4

5B. Briefly explain the consequences of defective immune system.

5C. Explain the immune effector mechanism against viral infections.

(10+5+5 = 20 marks)