Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2009

SUBJECT: MODERN PHARMACEUTICAL ANALYSIS (PQA 601)

SPECIALIZATION: PHARMACEUTICS / PHARMACOLOGY / PHARM. QUALITY ASSURANCE / PHARM. BIOTECHNOLOGY

Wednesday, May 27, 2009

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

- **Answer ALL questions.**
- **Draw neatly labelled diagrams wherever necessary.**

1A. Explain various factors affecting absorption spectra with suitable examples.

1B. Explain the quantitative applications of IR spectroscopy with examples.

1C. Explain the usefulness of IR spectroscopy in structural elucidation with suitable examples.

(10+5+5 = 20 marks)

2A. Explain the derivatization in fluorimetry with two examples.

2B. List the differences and limitations between IR and Raman spectroscopy.

2C. List seven capillary electrophoresis modes. Explain each mode in brief.

(5+5+10 = 20 marks)

3A. Explain the applications of ELISA in diagnosis.

3B. Explain the construction, working, advantages and disadvantages of thermal conductivity detector.

3C. Write a note on solvent selection in HPLC.

3D. What is in-situ densitometry in HPTLC? Explain the calibration curve method of quantitative estimation using HPTLC.

(5×4 = 20 marks)

4A. Explain the principle, advantages and working of supercritical fluid chromatography.

4B. Write the theory of NMR spectroscopy.

4C. What is chemical shift? Explain the factors affecting chemical shift with examples. How many NMR signals will arise from acetaldehyde?

(5+5+10 = 20 marks)

5A. Classify the mass spectrometer. Explain the construction and working of double focusing mass spectrometer.

5B. What is metastable ion? Explain with example and give its significance.

5C. Explain the hyphenated techniques in brief.

(10+5+5 = 20 marks)

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MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2009

SUBJECT: INDUSTRIAL MICROBIOLOGY (PBT 601)

SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY

Thursday, May 28, 2009

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

✍ **Answer all the questions.**

1A. Draw neat labeled diagram of a typical bacterial cell and discuss the structures external to cell wall.

1B. Explain the alternative pathways to glycolysis for oxidation of glucose by bacteria. Differentiate between anabolism and catabolism.

(10+10 = 20 marks)

2A. Enlist any four important characteristics of viruses and discuss the replication process of bacteriophage.

2B. What is fungal dimorphism? Explain the different stages in formation of sexual spores.

2C. With a neat labeled diagram, explain the formation of bacterial endospore.

(10+5+5 = 20 marks)

3A. List out the criteria to design a medium for industrial fermentations and outline the salient features for media formulation.

3B. Draw comparison of batch and continuous culture for biomass productivity.

(10+10 = 20 marks)

4A. Discuss the production of streptomycin.

4B. Discuss the production of L- Glutamic acid emphasizing biosynthesis and briefly outline the production process.

(10+10 = 20 marks)

5A. Explain how does numerical aperture influence resolving power and suggest the ways to increase numerical aperture.

5B. Enlist the significant pathogenic *Chlamydiae* and write briefly the unique life cycle of *Chlamydia.*

5C. Write short note on Lipases.

5D. Write any two commercial processes of steroidal conversions mentioning the nature of reaction, substrate, product and microorganism.

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

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MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2009

SUBJECT: BIOPROCESS ENGINEERING (PBT 602)

SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY

Friday, May 29, 2009

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

✍ **Answer all the questions.**

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

1B. Discuss Waldhof-type fermenter and Acetators and Cavitators.

(10+10 = 20 marks)

2A. What are the methods for sterilizing air? Discuss the design of depth filters.

2B. Explain pseudo plastic rheology of fermentation broth with examples.

(10+10 = 20 marks)

3A. Discuss the principle behind the design of rotary drum filter. Explain its working and application.

3B. What are the mechanisms involved in adsorption? Give the analysis of adsorption phenomena for a packed bed column.

(10+10 = 20 marks)

4A. Explain the dynamic method of gassing out for determination of K_La. Mention the relationship between power consumption and K_La.

4B. Explain the construction and working of a spray dryer with the help of a neat labeled diagram.

(10+10 = 20 marks)

5. Write short notes on:

5A. Magnetic drives

5B. Thermistors

5C. Scale down

5D. Electrophoresis.

(5×4 = 20 marks)

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MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2009

SUBJECT: MODERN PHARMACEUTICAL BIOTECHNOLOGY (PBT 603)

SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY

Saturday, May 30, 2009

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

Answer all the questions.

1A. Define MDRTB. Discuss the strategies for TB vaccine development and challenges involved with a note of few promising candidates in clinical trail.

1B. Explain the role of Dendritic cells and Cytokines in designing vaccines. Add a note on enhancement of co-stimulation in therapeutic vaccine design and Reverse vaccinology.

(10+10 = 20 marks)

2A. Explain the limitations of bacteria as host in recombinant DNA technology and suggest the alternative and better hosts.

2B. With regard to the production of hepatitis B vaccine, explain the following with reasoning:

i) selection of host

ii) selection of vector

iii) Fermentation conditions.

(10+10 = 20 marks)

3A. What are the advantages of immobilization of enzymes? Discuss the entrapment method in detail.

3B. Explain the chemical treatment methods for extracting an enzyme. Outline the purification method of an extracted enzyme.

(10+10 = 20 marks)

4A. Explain Sanger and Maxam Gilbert methods for DNA sequencing.

4B. Explain the mechanism, advantages and disadvantages of RNAi. Add a note on polyethylenimine modifications and RISC-RNA induced silencing complex.

(10+10 = 20 marks)

5A. Discuss the role of Pharmacogenetics and Pharmacogenomics in drug metabolism.

5B. Give an account of Patterns of Stem cell differentiation and assessment of Human stem cell safety in Stem Cell Research.

5C. Schematically represent direct and indirect ELISA.

(10+5+5 = 20 marks)

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MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2009

SUBJECT: PHARMACEUTICAL ANALYSIS & PRODUCT DEVELOPMENT (PQA 604)

SPECIALIZATION: PHARMACEUTICAL QUALITY ASSURANCE

Monday, June 01, 2009

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

Answer all the questions.

1A. Explain the different types of polarography.

1B. Discuss in detail about the applications of hyphenated techniques in the analysis of drugs in biological fluids.

(10+10 = 20 marks)

2A. Explain the principle and procedures involved in the evaluation of antimicrobial agents in injectables.

2B. Write in detail about the types, principles and methodology employed in immunoblotting.

(10+10 = 20 marks)

3A. Enumerate the difference between qualitative and quantitative analysis. What is semiquantitative analysis? Explain any one semiquantitative assay method.

3B. Write about the evaluation of plastic containers used for injectable preparations.

(10+10 = 20 marks)

4A. Explain the prediction of shelf life of semisolid dosage forms.

4B. What do you mean by IVIVC? How the dissolution testing devices have relevance to IVIVC? Explain in detail.

(10+10 = 20 marks)

5A. Write a short note on in-vitro evaluation of liposomes.

5B. Describe the various methods used for the determination of partition coefficient.

(10+10 = 20 marks)

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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2009

SUBJECT: MOLECULAR BIOLOGY AND IMMUNOLOGY (PBT 604)

SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY

Monday, June 01, 2009

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

Answer all the questions.

1A. With Hemoglobin as an example, explain developmentally controlled complex gene families and explain the different regulatory units in yeast.

1B. What is GRB-2? What is its function? What role do the SH2 & SH3 domain plays in the function of GRB-2?

(10+10 = 20 marks)

2A. Explain in detail, how MPF regulates the following functions in a cell:

i) Breakdown of nuclear envelope.

ii) Chromosome condensation.

2B. Write a note on viral oncogenesis.

(10+10 = 20 marks)

3A. How do antibodies, which all have the same shape, recognize antigens of a wide variety of different shapes? Discuss.

3B. Enumerate the cells involved in antigen presentation and explain how an antigen is processed and presented to T cell receptors.

(10+10 = 20 marks)

4A. Explain the role of complement system in immunity.

4B. Explain any three methods for the determination of cytotoxicity, mentioning the advantages and disadvantages of each of them.

(10+10 = 20 marks)

5A. Explain in detail the different enzymes involved in the DNA replication and their specific function. Add a note on conservative and Semi conservative replication.

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

5C. Explain briefly the etiology of autoimmune disorders.

(10+5+5 = 20 marks)