Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2010

SUBJECT: MODERN PHARMACEUTICAL ANALYSIS (PQA 601)

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

Thursday, May 27, 2010

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

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

1A. Define Lamberts-Beer's law and derive an expression for the same.

1B. Explain the construction and working of any two detectors used in UV Visible spectrophotometer.

1C. Discuss the factors influencing vibrational frequencies of molecules.

1D. Explain the solid sampling technique in IR spectroscopy.

(5×4 = 20 marks)

2A. Explain with suitable examples, the effect of solvent and temperature on absorption spectra.

2B. Explain the factors affecting quenching of fluorescence.

2C. Discuss the inductive effect and diamagnetic effect.

2D. Explain the steps involved in NMR data interpretation.

(5×4 = 20 marks)

3A. Write a note on size exclusion chromatography.

3B. Explain the construction and working of electrochemical detector. Explain the advantages in terms of sensitivity and specificity.

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

3D. Explain the meaning of split, splitless an on column injection. Explain various sample injection systems in brief.

(5×4 = 20 marks)

4A. With suitable example discuss about chemical ionization.

4B. Discuss in detail about MALDI-TOF.

4C. Discuss the principle, various methods and applications of capillary electrophoresis.

(5+5+10 = 20 marks)

5A. Write a note on triple quadrupole mass analyzer.

5B. Discuss the applications of ELISA and RIA.

5C. Compare HPTLC and TLC.

5D. Explain derivative spectroscopy with suitable examples.

(5×4 = 20 marks)

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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2010

SUBJECT: INDUSTRIAL MICROBIOLOGY (PBT 601)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Friday, May 28, 2010

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

Answer ALL questions.

1A. With respect to microbial metabolism, explain collision theory that describes the occurrence of chemical reactions. Name the enzyme components and enlist the factors influencing enzyme activity.

1B. Define mutation and enlist mutagens. Discuss types of mutations, emphasizing their effects on health.

(10+10 = 20 marks)

2A. Compare fungi with bacteria and discuss the morphological feature of molds.

2B. Schematically represent the replication of bacteriophages and enlist the cultivation methods of animal viruses.

2C. Briefly outline the advantages of microbial bioconversions over other methods.

(10+5+5 = 20 marks)

3A. Discuss the influence of substrate concentration on the biomass concentration and specific growth rate, specifying the relevant equations with emphasis on Monod's Equation.

3B. Explain the criteria to design a medium for industrial fermentations and briefly outline the factors influencing the choice of carbon source.

(10+10 = 20 marks)

4A. Taking the production of penicillin as an example, discuss the important features of aerobic fermentations.

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

(10+10 = 20 marks)

5A. Write short notes on Golgi apparatus.

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

5C. Write short notes on "Single cell protein".

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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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2010

SUBJECT: BIOPROCESS ENGINEERING (PBT 602)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Saturday, May 29, 2010

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 aeration system.

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

(10+10 = 20 marks)

2A. Explain the mechanisms of filtration. Describe the design of a depth filter and effect of increasing linear air velocity on X_{90}.

2B. Mention the scale up difficulties. Explain the approaches to overcome the same through scale down methods.

(10+10 = 20 marks)

3A. Discuss the different phases of a typical drying curve. Explain the construction and working of a fluidized bed dryer.

3B. Discuss the construction and working of a perforated basket centrifuge.

(10+10 = 20 marks)

4A. Illustrate resistances for oxygen transfer through an air bubble to cytosol. Explain the dynamic method of gassing out for determination of K_La.

4B. Explain the phenomenon of adsorption. Give the analysis of changes in solute adsorption in fixed bed chromatography.

(10+10 = 20 marks)

5. **Write short notes on:**

5A. Safety valves

5B. Comparison of Fluidized bed reactors with Hollow fiber reactor on any five selected parameters

5C. Pseudoplastic rheology

5D. Dialysis

(5×4 = 20 marks)

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MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2010

SUBJECT: MODERN PHARMACEUTICAL BIOTECHNOLOGY (PBT 603)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Monday, May 31, 2010

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

Answer ALL questions.

1A. Enlist the different modern vaccine technologies and explain synthetic peptide based vaccines in detail with reference to different approaches for its design, advantages and applications.

1B. Write a note on anti-cancer vaccines with an explanation on principles of therapies, classification of tumor antigens and DNA vaccination.

(10+10 = 20 marks)

2A. Discuss various approaches in the vaccine development against hepatitis B virus. Explain why yeast is considered as the ideal host system for the production of hepatitis B vaccine.

2B. Briefly discuss the gene cloning procedures.

(10+10 = 20 marks)

3A. State and derive Michaelis-Menton equation. Explain the method for determining Km and Vmax values.

3B. Explain the chemical treatment methods used for extracting an enzyme.

(10+10 = 20 marks)

4A. Define Biomarkers and explain different tumor markers in detail.

4B. Explain principle, methods, advantages, disadvantages and applications of Radioimmunoassay.

(10+10 = 20 marks)

5A. Discuss in detail Sequence alignment.

5B. Explain the mechanism of RNA interference.

5C. Write short notes on cryopreservation of cell cultures and revival of cells.

(10+5+5 = 20 marks)

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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2010

SUBJECT: MOLECULAR BIOLOGY AND IMMUNOLOGY (PBT 604)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Tuesday, June 01, 2010

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

Answer ALL questions.

1A. Define Gene expression, Gene regulation, Genotype and phenotype. What are the genetic notations to be followed to denote the genotype and phenotype property of an organism? Add a note on background constitutive synthesis with respect to the *lac operon* model and the importance of cAMP-CRP complex.

1B. Explain various types of extra cellular messengers and receptors involved in signaling process.

(10+10 = 20 marks)

2A. Explain how does APC trigger mitotic cyclins.

2B. Describe various members of the *ras* multigene family. Explain their importance as oncogenes.

(10+10 = 20 marks)

3A. The ability of immunoglobulins to react with a wide variety of antigens is due to diversity. Explain this, mentioning the theories and possible mechanisms for this diversity.

3B. Describe the salient features of MHC molecules with diagram and their role in cell mediated immunity.

(10+10 = 20 marks)

4A. Enlist the different types of hypersensitivity reactions. Discuss any one in detail.

4B. Discuss the various immunoprecipitation techniques and their applications as analytical tools.

(10+10 = 20 marks)

5A. Explain protein synthesis with reference to polypeptide chain initiation, chain elongation and chain termination in prokaryotes.

5B. Outline the various components of immune system.

5C. With appropriate examples, differentiate between primary immunodeficiency and secondary immunodeficiency diseases.

(10+5+5 = 20 marks)