

MANIPAL UNIVERSITY**M. PHARM. PART-I DEGREE EXAMINATION – MAY/JUNE 2014****SUBJECT: MICROBIAL BIOCHEMISTRY AND IMMUNOLOGY (PBT 601)
(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)**

Monday, May 26, 2014

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

Answer ALL the questions.

- 1A. Enlist the methods of gene transfer among bacteria. Explain the mode of gene transfer in bacteria that involves bacterial viruses.
- 1B. Explain the morphology, pathogenesis, laboratory diagnosis and serological tests of PPLO.
(10+10 = 20 marks)
- 2A. Explain the conversions taking place in a catabolic pathway that breaks down glucose to pyruvate and lactate, with a note on its energetics.
- 2B. Explain in detail the *De novo* synthesis of fatty acids.
(10+10 = 20 marks)
- 3A. Discuss the generation of antibody diversity.
- 3B. Explain how an antigen is processed and presented to T cell receptors.
(10+10 = 20 marks)
- 4A. With one example, discuss how host immune system combats pathogen.
- 4B. Explain the production of monoclonal antibodies by hybridoma technology, and enlist their applications.
(10+10 = 20 marks)
- 5A. Differentiate between competitive inhibition and non-competitive inhibition.
- 5B. Elaborate the role of dendritic cells on immunity.
- 5C. What are cytokines? Enlist them and explain TNFs, emphasizing on structure and biological function.
- 5D. Write a short note on alloreactivity of T cells.
(5+5+5+5 = 20 marks)



MANIPAL UNIVERSITY

M. PHARM. PART-I DEGREE EXAMINATION – MAY/JUNE 2014

SUBJECT: BIOPROCESS ENGINEERING AND TECHNOLOGY (PBT 602) (SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Wednesday, May 28, 2014

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

- 1A. In designing a fermenter, not only aseptic operations but also containment aspect has to be given more emphasis. Explain. Discuss temperature control in fermenter.
- 1B. Explain the criteria used to design a medium for industrial fermentations and briefly outline the factors influencing the choice of carbon source.

(10+10 = 20 marks)

- 2A. What is D-Value? Discuss the temperature-survival curves of susceptible and resistant forms of microorganisms.
- 2B. What is a rheogram? Explain the rheological changes which occur in streptomycete fermentation.

(10+10 = 20 mark)

- 3A. Describe the construction and working of a Rotary Drum filter.
- 3B. Define adsorption. Explain the principle and applications of affinity chromatography.

(10+10 = 20 marks)

- 4A. Discuss fermentative production of citric acid.
- 4B. What is an auxotroph? Explain the direct fermentative pathway for lysine production.

(10+10 = 20 marks)

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

- 5A. Gate and Globe valves
- 5B. Fluidized bed reactor
- 5C. Primary screening and Secondary screening
- 5D. Pirt Kinetics of product formation

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



MANIPAL UNIVERSITY

M. PHARM. PART-I DEGREE EXAMINATION – MAY/JUNE 2014

SUBJECT: MODERN PHARMACEUTICAL BIOTECHNOLOGY (PBT 603)
(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

Friday, May 30, 2014

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 restriction enzymes in rDNA technology with suitable examples.
- 1B. Discuss the production of recombinant hepatitis vaccine with critical comments on the selection of host system.
- (10+10 = 20 marks)
- 2A. Discuss the immunotherapy for tumors.
- 2B. Explain the molecular biology and immunology of Listerial infection and discuss the design of Listeria monocytogene strains for vaccine.
- (10+10 = 20 marks)
- 3A. Enlist the different methods of Gene sequencing and explain Sanger's methods in detail.
- 3B. Define and classify microarray techniques. Explain fluorescent detection techniques of microarray.
- (10+10 = 20 marks)
- 4A. Define and classify stem cells. Explain adult stem cells in detail with a note on its applications.
- 4B. Define Nano-Biotechnology and explain microbial nanoparticle production with example.
- (10+10 = 20 marks)
- 5A. Define K_M . Derive Michaelis-Menten equation of enzyme kinetics.
- 5B. Write a note on the role of enzymes in food industry.
- 5C. Define Bioinformatics and write a note on Biological Databases.
- (10+5+5 = 20 marks)



MANIPAL UNIVERSITY

M. PHARM. PART-I DEGREE EXAMINATION – MAY/JUNE 2014

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

Monday, June 02, 2014

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

✍ Answer ALL the questions.

- 1A. Discuss the enzymology of DNA replication.
- 1B. Discuss the important differences in gene expression of eukaryotes and prokaryotes.
(10+10 = 20 marks)
- 2A. What are second messengers? Explain how cAMP and Ca^{++} act as second messengers.
- 2B. Discuss the two important pathways of apoptosis.
(10+10 = 20 marks)
- 3A. Differentiate biologics from biopharmaceuticals. Envisage various stages in clinical trials and highlight the specific purpose of each stage.
- 3B. Discuss the current status and future prospects of biopharmaceuticals.
(10+10 = 20 marks)
- 4A. Elaborate CDS with reference to manufacturing facility and briefly outline the steps for generating purified water and water for injection.
- 4B. Write a note on IGFs with respect to receptors and biological effects.
(10+10 = 20 marks)
- 5A. Write a note on transposons.
- 5B. With a suitable example, explain Knudson's two hit hypothesis.
- 5C. Write a note on degradation of cyclins.
- 5D. Define gene therapy and explain viral based vectors used in gene therapy.
(5+5+5+5 = 20 marks)

