

MANIPAL UNIVERSITY

FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2016

SUBJECT: MICROBIAL BIOCHEMISTRY AND IMMUNOLOGY (PBT 601T) (SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY) (2014 REGULATION)

Friday, May 20, 2016

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

1. Explain various physical requirements for the growth of bacteria. Add a note on oxygen toxicity in anaerobes.
(10 marks)
2. With the help of neat labelled diagram, explain the lysogenic cycle of bacteriophages. Add a note on its significance.
(10 marks)
3. Sketch Kreb's cycle and discuss various oxidation - reduction reactions. Add a note on the role of coenzymes.
(10 marks)
4. Explain in detail, steps involved in the biosynthesis of cholesterol.
(10 marks)
5. Explain the activation of B cells by thymus dependent and thymus independent antigens.
(10 marks)
6. Draw an outline of events following an infection. Add a note on the role of T- helper cells in immunity.
(10 marks)
7. Discuss immunohistochemistry as an analytical tool.
(10 marks)
8. Explain the principle and methodology of any two assays of cytotoxicity.
(10 marks)
- 9A. Sketch the degradation of purine ribonucleotides.
- 9B. Describe non-specific defence mechanism of immune system against pathogen.
(5+5 = 10 marks)
- 10A. What are inflammatory cells? Explain the purpose of inflammation and its importance in immunity.
- 10B. Explain immune effector mechanisms against viral infections.
(5+5 = 10 marks)



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FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2016

SUBJECT: BIOPROCESS ENGINEERING AND TECHNOLOGY (PBT 602T)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

(2014 REGULATION)

Monday, May 23, 2016

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

✍ **Answer ALL questions.**

1. Identify the structural components of a fermenter for aeration and agitation and discuss impellers. (10 marks)
2. Draw comparison between batch culture and continuous culture for metabolite productivity. (10 marks)
3. What are Bull's criteria in the choice of organism for isolation? Design the protocol for isolating an antibiotic producing organism. (10 marks)
4. Illustrate the temperature survival curves of bacterial endospores. What is Maillard's reaction? How can it be overcome? (10 marks)
5. Discuss dynamic gassing out technique for determination of K_{La} . (10 marks)
6. Differentiate between precipitation and crystallization. Add a note on Mier's supersaturated theory crystallization. (10 marks)
7. Explain the principle and applications of affinity chromatography. (10 marks)
8. Describe the fermentative production of Glutamic acid. (10 marks)
- 9A. Give an account of Piston and Needle valves.
- 9B. What are the criteria to select nutrients to design a production medium for industrial fermentations? (5+5 = 10 marks)
- 10A. Write a note on microbial transformation of steroids.
- 10B. Explain the biosynthesis of Penicillin. (5+5 = 10 marks)



MANIPAL UNIVERSITY

FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2016

SUBJECT: MODERN PHARMACEUTICAL BIOTECHNOLOGY (PBT 603T)

(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)

(2014 REGULATION)

Wednesday, May 25, 2016

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

✍ Answer ALL questions.

1. Explain the mode of gene transfer which takes place in bacteria with the aid of bacteriophages. (10 marks)
2. Discuss the production of recombinant insulin. (10 marks)
3. Give an elaborate account of DNA vaccine delivery systems and uptake mechanisms. Add a note on adjuvants. (10 marks)
4. Explain the principle and procedure involved in the production of monoclonal antibodies. (10 marks)
5. Define K_m . Derive the Michaelis-Menten equation of enzyme kinetics. (10 marks)
6. Write a note on biological databases, enlist database management tools and discuss any two of them in detail. (10 marks)
7. What are the similarities of embryonic and adult stem cells? Add a note on role of stem cells in therapeutics. (10 marks)
8. What are microfluidic devices? Add a note on manufacture of microfluidic components. (10 marks)
- 9A. Write a note on pluripotent stem cells and their advantages in therapy.
- 9B. Explain the facilities needed to set up an animal cell culture laboratory. (5+5 = 10 marks)
- 10A. Write short notes on agarose gel electrophoresis.
- 10B. Write short notes on the various chemical methods involved in extraction of an endoenzyme. (5+5 = 10 marks)



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FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2016

SUBJECT: MOLECULAR BIOLOGY AND DRUG DISCOVERY (PBT 604T)
(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)
(2014 REGULATION)

Friday, May 27, 2016

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

✍ Answer ALL the questions.

1. Explain protein synthesis with reference to polypeptide chain initiation, chain elongation and chain termination in prokaryotes. (10 marks)
2. Enlist different types of gene regulation. Explain *trp* operon in detail. (10 marks)
3. Discuss PI-3 Kinase pathway. Add a note on importance of cAMP as a second messenger. (10 marks)
4. What is MPF? Explain its role in the regulation of cell cycle? Add a note on activation of MPF. (10 marks)
5. Describe the various members of *ras* multigene family. Explain their role as oncogenes. (10 marks)
6. Discuss rational drug design for the development of biopharmaceuticals and mention the specific advantages of combinatorial approach to drug discovery. (10 marks)
7. Enlist the various sources of biopharmaceuticals and explain the role of yeasts and molds in their production. (10 marks)
8. What are cytokines? Explain the production of Interleukin-2. (10 marks)

- 9A. Write a note on vector systems used to deliver genes into mammalian cells.
- 9B. "The end goal is prevention of expression of particular gene product". How does antisense approach help in this?

(5+5 = 10 marks)

- 10A. Schematically represent the layout for clean rooms and mention the important components of a clean room.
- 10B. What are the differences between a nucleosome, a core particle and an octameric disc? Which directly involves the histone H1?

(5+5 = 10 marks)

