MANIPAL UNIVERSITY

FIRST YEAR M. PHARM. DEGREE EXAMINATION - MAY 2017
SUBJECT: MICROBIAL BIOCHEMISTRY AND IMMUNOLOGY (PBT 601T)
(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)
(2014 REGULATION)
Saturday, May 20, 2017 (10.00 - 13.00 Hrs.)

Marks: 100 **Duration: 180 mins.**

Answer ALL the questions.

1)	Discuss normal bacterial growth curve and mention the significance of each phase. Add a note on generation time.	(10)
2)	Sketch the lytic cycle of bacteriophage. Differentiate lytic cycle from lysogenic cycle.	(10)
3)	Enlist the contributors and sketch the *de novo* synthesis of IMP. Explain why IMP is considered as the parent purine nucleotide.	(10)
4)	Explain the Krebs-Henseleit cycle. Add a note on its energetics, regulation and disorders.	(10)
5)	Immune system that protects our body from invasion of pathogens can be categorized into two lines or stages. State and describe the two types of immune system.	(10)
6)	Describe and compare the Humoral and Cell mediated immunity.	(10)
7)	Describe the immune responses in viral infections with a special mention on influenza.	(10)
8)	Discuss the production of monoclonal antibodies by hybridoma technology and mention their applications.	(10)
9A)	Sketch the reactions of energy generation phase of glycolysis. Add a note on its energetics.	(5)
9B)	Write short notes on cytokines.	(5)
10A)	Classify and describe MHC molecules.	(5)
10B)	Explain the principle and brief procedure of affinity chromatography.	(5)

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FIRST YEAR M. PHARM. DEGREE EXAMINATION - MAY 2017
SUBJECT: BIOPROCESS ENGINEERING AND TECHNOLOGY (PBT 602T)
(SPECIALIZATION: PHARMAceutical BIOTECHNOLOGY)
(2014 REGULATION)
Tuesday, May 23, 2017 (10.00 - 13.00 Hrs.)

Duration: 180 mins.

Marks: 100

Answer ALL the questions.

1)	Draw a neat labeled diagram of an Industrial Fermenter and discuss stirrer glands and bearings.	(10)
2)	Define screening and differentiate primary screening from secondary screening. Describe isolation methods not utilizing selection of the desired characteristics.	(10)
3)	Explain the factors influencing the choice of carbon source for formulating the production medium and give examples for commonly used carbon sources.	(10)
4)	Illustrate and explain the survival curves of bacterial endospores.	(10)
5)	Mention the resistances for oxygen transfer across a cytosol. Explain the sulfite oxidation method for determination of K_La.	(10)
6)	With the help of a neat diagram explain the working and application of a rotary continuous filter.	(10)
7)	Explain the working principle and application of a Freeze dryer.	(10)
8)	Describe the dual fermentation of L-lysine.	(10)
9A)	Give an account of Plug valves and Butterfly valves.	(5)
9B)	Explain the method of sensing and control of foam in Fermenters.	(5)
10A)	Write a note on biosynthesis of cephalosporin.	(5)
10B)	Explain production of alpha-amylase.	(5)

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FIRST YEAR M. PHARM. DEGREE EXAMINATION - MAY 2017
SUBJECT: MODERN PHARMACEUTICAL BIOTECHNOLOGY (PBT 603T)
(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)
(2014 REGULATION)
Thursday, May 25, 2017 (10.00 - 13.00 Hrs.)

Marks: 100 **Duration: 180 mins.**

Answer ALL the questions.

1)	Discuss recombinant DNA technology with respect to; selection criteria for vectors, limitations as hosts and enzymes used in this technology.	(10)
2)	Discuss the role of promoters and host cells in the production of recombinant Hepatitis B vaccine. Add a note on applications of gene cloning.	(10)
3)	Discuss the immunological response to DNA vaccines. Add a note on adjuvants and methods of administration of DNA vaccines.	(10)
4)	Discuss immunotherapy of tumors.	(10)
5)	Define enzymes. Explain in detail, the criteria involved in the selection of source for enzymes.	(10)
6)	Discuss the types and implications of Single Nucleotide Polymorphism (SNPs) on human health.	(10)
7)	Discuss the concept of bioinformatics based computer aided drug design. Add a note on data mining tools.	(10)
8)	Explain the theory, instrumentation and applications of RIA.	(10)
9A)	Explain the concept of microfluidic devices and their applications.	(5)
9B)	Explain the potential applications of stem cells.	(5)
10A)	Citing suitable examples, explain different types of animal cell cultures.	(5)
10B)	Explain the effect of substrate, enzyme and product concentration on enzyme activity.	(5)

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FIRST YEAR M. PHARM. DEGREE EXAMINATION - MAY 2017
SUBJECT: MOLECULAR BIOLOGY AND DRUG DISCOVERY (PBT 604T)
(SPECIALIZATION: PHARMACEUTICAL BIOTECHNOLOGY)
(2014 REGULATION)
Saturday, May 27, 2017 (10.00 - 13.00 Hrs.)

Marks: 100 **Duration: 180 mins.**

Answer ALL the questions.

1)	Explain the role of RNA polymerase in transcription with a note on its subunits and post transcriptional modifications of eukaryotic mRNA.	(10)
2)	Enlist different types of gene regulation. Explain *trp* operon in detail.	(10)
3)	Write a note on second messengers. Discuss how Ca2+ and cAMP act as second messengers.	(10)
4)	Describe the mammalian cell cycle with emphasis on various regulatory check points.	(10)
5)	What is ubiquitination? Explain how it helps in degradation of cyclins.	(10)
6)	Enlist the sources of biopharmaceuticals explain the advantages and disadvantages for using microorganisms as a source for recombinant proteins.	(10)
7)	Schematically represent the life history of a successful drug. Add a note on the functions of FDA.	(10)
8)	Write a note on importance of cleaning, decontamination and sanitation of Biological manufacturing areas.	(10)
9A)	Describe the production of Interleukin-2.	(5)
9B)	Explain the best stages in the process of erythropoiesis.	(5)
10A)	Explain the basic approach to gene therapy.	(5)
10B)	Describe the experiment to prove DNA replication is semiconservative.	(5)