

SARDAR PATEL UNIVERSITY
TY BSc EXAMINATION
2011
Monday, 10th October
10.30 am to 1.30 pm
MI 301: MICROBIOLOGY
(MICROBIAL GENETICS)

Total Marks: 80

Note: (1) All the question are compulsory.
(2) Figures to the right indicate full marks.

Q-1

- (A) Explain in detail the chemistry and structure of DNA [09]
 (B) Write a short note on post transcriptional modifications. [04]

OR

Q-1 Write short notes on :

- (A) Yeast as model system for studying genetics. [05]
 (B) Role of RNA polymerase and auxillary proteins in initiation of transcription [08]

- Q-2** Discuss the role of chromosomal replication with enzymes involved in detail. [13]

OR

Q-2

- (A) Discuss the experiment to prove the semi conservative mode of DNA replication. [07]
 (B) Explain the following terms :- [06]
 (1) Supercoiling of DNA; (2) Conservative mode of DNA replication;

- Q-3** Define Genetic code. Enlist and describe the salient features of Genetic code. [14]

OR

Q-3 Write Notes on:

- (A) Post translational changes in protein. [10]
 (B) Wobble hypotheis [04]

- Q.4
(a) Write a note on Ames's test. [07]
(b) Explain fluctuation test in proving spontaneous nature of mutation [07]
OR

- Q.4
(a) Explain the mode of action of: [09]
(i) U.V radiation (ii) Nitrous acid (iii) 5-Bromouracil
(b) Describe the methods of isolation of drug-resistant mutant. [05]

- Q.5
(a) Describe the process of transformation in Streptococcus pneumoniae and Hemophilus influenzae. [13]
OR

- Q.5
(a) Explain the mechanism of specialized transduction in bacteria citing a suitable example. (08)
(b) What is conjugation? Explain conjugation in gram positive bacteria. (05)

- Q.6
(a) Write short notes on the following:
(A) One – step growth experiment [07]
(B) Phenotypic mixing. [06]
OR

- Q.6
Write a notes on the following:
(A) Conditional lethal mutants. [07]
(B) Host range mutants. [06]



SARDAR PATEL UNIVERSITY
T.Y.B.Sc. EXAMINATION
Tuesday, 11th October 2011
10.30 a.m. to 1.30 p.m.
MI 302 : MICROBIOLOGY

Total Marks : 80

- Q.1 (a) What is Bioinformatics ? Explain the applications of Bioinformatics in detail. [08]
- (b) The percentage of Water, Lipid, Protein and other materials are 66.35%, 6.66%, 5.2%, 21.79% respectively in the body of a species of Fish. Draw a pie chart with the help of the given data. [04]
- (c) Explain what is Computer Memory. [02]
- OR**
- Q.1 (a) Write a note on "Histogram" [05]
- (b) Define standard Deviation (s) and give the mathematical expression for calculating standard deviation of individual and grouped data. [03]
- (c) Explain the following terms. [06]
- (i) Median (iii) Co-efficient of variation
- (ii) Hardware
- Q.2 (a) Discuss principle, instrumentation, method and application of Atomic Absorption spectroscopy. [08]
- (b) Explain principle and application of Infrared spectroscopy. [05]
- OR**
- Q.2 (a) Discuss principle, working and application of SDS- PAGE [08]
- (b) Explain principle and application of Flame photometry. [05]
- Q.3 (a) Explain principle, working and application of Molecular sieve chromatography. [07]
- (b) Describe the Basic principle of sedimentation. [06]
- OR**
- Q.3 Write notes on :
- (a) Ion-exchange chromatography [07]
- (b) Thin layer chromatography [06]

- Q-4 Write notes on :
- (A) Western Blotting [04]
 - (B) Immunofluorescence [05]
 - (C) RIA [04]

OR

- Q-4
- (A) What are Biosensors? Discuss in detail the principle method and application of biosensor with an example [08]
 - (B) Enlist various methods of immobilization and explain the method of entrapment. [05]

- Q-5
- (A) What is gene library? How many types of gene libraries are there and discuss the preparation of genomic library. [06]
 - (B) What are the important features of vectors? Explain plasmid PBR 322 and BAC. [08]

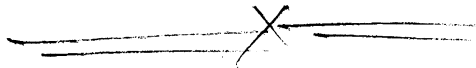
OR

- Q-5 Write notes on :
- (A) Ligation. [05]
 - (B) Isolation of DNA [04]
 - (C) Basic process of Polymerase Chain Reaction [05]

- Q-6
- (A) What is DNA sequencing? Explain the methods used in DNA sequencing. [09]
 - (B) Enlist the various methods of detection of recombinant clones and explain FISH. [04]

OR

- Q-6 Write notes on :
- (A) Southern Hybridization [05]
 - (B) Microarray and its applications [04]
 - (C) RFLP [04]



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SARDAR PATEL UNIVERSITY
T.Y.B.Sc. EXAMINATION
Wednesday, 12th October
2011
10.30 a.m to 1.30 p.m
MI 303 - MICROBIAL BIOCHEMISTRY

Total Marks: 80

- Q.1 Discuss the biochemical pathway operating in Rhodospirillum rubrum during dark phase [13]
- OR**
- Q.1 (a) Justify : Gluconeogenesis is not an exactly reversal of glycolysis. [06]
(b) Explain : Anapleurotic reaction replenish intermediates of TCA cycle. [07]
- Q.2 Write notes on:-
(a) Catabolism of purine and pyrimidines. [07]
(b) Kreb - Hansleit cycle. [06]
- OR**
- Q.2 Write in detail about Synthesis and regulation of pyrimidine nucleotides. [13]
- Q.3 Write notes on:-
(a) Use of biochemical mutant in intermediary metabolism. [05]
(b) Chemiosmotic theory [05]
(c) Justify : ATP is reffered as currency of cell. [04]
- OR**
- Q.3 Write notes on:-
(a) Photosynthetic apparatus [07]
(b) Anaerobic respiration [04]
(c) Substrate level phosphorylation [03]

Q-4 Justify using different assumptions that initial velocity (v_0), maximum velocity (V_{max}) and substrate concentration [S] are related through M-M constant K_m . [13]

OR

Q-4
(A) Write a short note on- Bisubstrate Reactions. [08]
(B) Write a short note on: Mechanism of lysozyme action [05]

Q-5
(A) Define active transport and discuss group translocation in detail. [08]
(B) Write a short note on: Bacteriorhodopsin. [06]

OR

Q-5
(A) Write a note on signal peptides [06]
(B) Discuss the various steps involved in the synthesis of murein [08]

Q-6
(A) Explain in detail the mechanism of resistance to antibiotics. [07]
(B) Write a short note on: Chemotaxis [06]

OR

Q-6 Define the term 'Antibiotic' and explain the mode of action of following chemotherapeutic agents: [13]
(i) Streptomycin (ii) Puromycin (iii) Zidovudine(AZT)
(iv) Chloromphenicol (v) Fusidic acid (vi) Sulfonamides

SARDAR PATEL UNIVERSITY
T.Y.B.Sc. EXAMINATION
2011
Thursday, 13th October
10.30 am to 1.30 pm
MI-304: MICROBIOLOGY

Total Marks: 80

Note: Figures to the right indicate full marks.

- Q.1 Write notes on:
- a) Microbial Virulence Factors. (07)
 - b) Classical Pathway of Complement. (07)
- OR**
- Q.1 (A) Write on: Phagocytosis. (10)
- (B) Explain the following terms: (04)
- (a) Gnotobiosis.
 - (b) Inflammation.
- Q.2 Write notes on:
- (a) Basic structure of Immunoglobulin. (08)
 - (b) Passive agglutination test. (05)
- OR**
- Q.2 Explain the following:
- (a) Properties of Antigens. (07)
 - (b) Complement Fixation test. (06)
- Q.3 Enlist and Explain the Factors influencing Antibody production. (13)
- OR**
- Q.3 Write notes on:
- (a) Primary and secondary immune organs. (07)
 - (b) Monoclonal Antibodies. (06)

- Q-4**
(A) Enlist different mechanisms of autoimmunity and discuss any two autoimmune diseases. [07]
(B) Define vaccine and discuss about attenuated and subunit vaccine. [06]
OR
- Q-4**
Classify different types of hypersensitivity and discuss in detail about type I and type III hypersensitivity. [13]
- Q-5**
(A) Define hematopoiesis and describe the formation of neutrophils. [08]
(B) Write a short note on: Hemostasis. [06]
OR
- Q-5**
(A) Explain in detail ABO blood group system. [08]
(B) Describe following [06]
(1) Bacteriophage typing
(2) Clinical significance of serum creatinine.
- Q-6**
(A) Write a short note on principle of epidemiology [06]
(B) Discuss causative agent and laboratory diagnosis of enteric fever. [07]
OR
- Q-6**
Discuss in detail causative agent, pathogenesis, transmission, laboratory diagnosis and treatment of AIDS. [13]

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SARDAR PATEL UNIVERSITY**T.Y.B.Sc. EXAMINATION****2011****Friday, 14th October****10.30 am to 1.30 pm****MI-305 : MICROBIOLOGY****AGRICULTURAL & ENVIRONMENTAL MICROBIOLOGY****Total Marks: 80****Note: Figures to the right indicate full marks.**

Q.1 What is Rhizosphere? Write an exhaustive note on Rhizosphere. [14]

OR

Q.1

(a) Explain in detail Sulfur Cycle. [08]

(b) Write a short note on Iron Cycle. [06]

Q.2 Write an essay on microbial insecticides. [13]

OR

Q.2

(a) Write a note on Nitrogen biofertilizers. [07]

(b) Explain Nitrogen Cycle. [06]

Q.3

(a) Explain commensalism with different examples showing interactions of microbial populations. [06]

(b) What is Synergism? Explain it in detail with different examples where microbes are involved. [07]

OR

Q.3 Write notes on:

(a) Predation - as interaction amongst microbes. [04]

(b) Antagonism among microbes. [03]

(c) Parasitism - interaction where microbes are involved. [06]

Q.4 Write notes on:

(a) Biodegradation of ABS. [06]

(b) Biodegradation of Chlorinated hydrocarbons. [07]

OR

Q.4 Write notes on:

(a) Biodeterioration of metals. [06]

(b) Biomegnification [07]

Q.5 Write short notes on:

(a) BOD [06]

(b) Microbial community in marine and fresh water environment. [07]

OR

Q.5 Write an essay on "Bacteriological analysis of water". [13]

- Q.6 Write short notes on:
- (a) Victorin Toxin and Tab toxin [06]
 - (b) Cuticular and pectinolytic enzymes [08]

OR

- Q.6
- (a) Explain in detail indirect mode of transmission of plant diseases. [07]
 - (b) General symptoms of plant diseases where pathogens or their parts are visible.- Explain it with examples. [07]



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SARDAR PATEL UNIVERSITY
T.Y. B.Sc. EXAMINATION
Saturday, 15th October 2011
10.30 a.m. to 1.30 p.m.
MI - 306 : MICROBIOLOGY

Total Marks: 80

Note: Figures to the right indicates marks.

Q.1

- (a) Describe the improvement of Strain using chemical mutagens. [07]
(b) Discuss the significance of Secondary Screening. [06]

OR

Q.1

- (a) Describe Primary Screening of organic acid and Vitamin Producers. [08]
(b) Write a note on Protoplast fusion. [05]

Q.2

- (a) Describe the role of nitrogen source and metabolic regulators in fermentation medium. [09]
(b) Write a note on batch fermentation. [05]

OR

Q.2

- (a) Write in detail on Solid State fermentation. [09]
(b) Discuss monitoring and control of temperature during fermentation. [05]

Q.3

- (a) Describe various factors affecting mass transfer of oxygen. [07]
(b) Write a note on Continuous Sterilization of medium. [06]

OR

Q.3 Write notes on:

- (A) Antifoam agents. [05]
(B) Sampling. [04]
(C) Scale up. [04]

- Q-4**
(A) Enlist different methods of cell separation and explain batch filters in detail. [09]
(B) Write a short note on- sterility testing. [05]

OR

- Q-4**
(A) Enlist various methods of liquid-liquid extraction and explain in detail solvent extraction of fermentation product. [09]
(B) Write a short note on- Disruption of microbial cells by biochemical methods. [05]

- Q-5**
Explain in detail the fermentative production of Vitamin B₁₂. [13]

OR

- Q-5**
(A) Discuss the production of semi-synthetic penicillins with examples of semi-synthetic penicillins structures. [08]
(B) Justify Biotin is important for cell permeability in glutamic acid production. [05]

- Q-6**
(A) Enlist extrinsic and intrinsic parameters affecting spoilage of food. Discuss in detail intrinsic parameters affecting spoilage of food. [07]
(B) Describe in brief production of baker's yeast. [06]

OR

- Q-6**
(A) Enlist the various methods of food preservation. Explain in detail the use of canning in preservation of food. [07]
(B) Discuss in brief food intoxication caused by *Staphylococcus aureus*. [06]

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