

SARDAR PATEL UNIVERSITY**T. Y. B.SC. EXAMINATION****2010****Thursday , 11th November****2.30 p.m. to 5.30 p.m.****BC-301 : Molecular Biology and Genetic Engineering****Max Marks : 80****Note : Number in parenthesis indicate marks**

- Q-1 (a) Define and give examples of gene. Which terminologies do you use for coding region and non-coding regions of gene? What is the approximate number of genes in Human Beings? (07)
- (b) Explain the Hershey-Chase experiment confirming nucleic acids as genetic information carriers. (07)

OR

- Q-1 (a) Explain the structure and function of eukaryotic tRNAs. (07)
- (b) Define/explain the following: (07)
- i. T_m value of DNA
 - ii. COT value
 - iii. Genome
 - iv. Z type of DNA
 - v. Grooves of DNA
 - vi. Supercoiling of DNA
 - vii. A type of DNA

- Q-2 (a) Give functions of following enzymes: (07)
- i. Topoisomerase
 - ii. Telomerase
 - iii. RNA Polymerase
 - iv. Helicase
 - v. DNA-dependent RNA polymerase
 - vi. Ribonuclease
 - vii. DNAase
- (b) Explain Meselson-Stahl experiment confirming semiconservative type of replication of DNA. (07)

OR

- Q.2 (a) Explain in detail about DNA Polymerase enzyme of prokaryotes. (07)
- (b) Explain the termination of DNA replication. (07)

- Q.3 Explain **any two** of the following: (12)
- i. Initiation of transcription
 - ii. Post transcriptional modification of eukaryotic mRNA
 - iii. Structures of transposable genetic elements
 - iv. Termination of transcription

- Q.4 Answer the following
- (a) Define Genetic Code and Explain different properties of Genetic code. [08]
 - (b) Explain Inhibition of protein synthesis by antibiotics and toxins [06]

OR

- Q.4 Explain in detail
- (a) Initiation of translation [07]
 - (b) Termination of translation [07]

- Q.5 Define operon and Explain Negative and positive regulation of Lac operon. [13]

OR

- Q.5 Write short notes on
- (a) Base analogues [03]
 - (b) Base excision repairs [05]
 - (c) Nucleotide excision repairs [05]

- Q.6 What is gene probes ? Explain Southern blotting and Northern blotting methods for detection of recombinant clone. [13]

OR

- Q.6 Write short notes on
- (a) Cosmids [04]
 - (b) DNA finger printing [05]
 - (c) maxam and Gilbert's method for gene sequencing. [04]



SARDAR PATEL UNIVERSITY
T. Y. B.SC. EXAMINATION
2010
Friday, 12th November
2.30 p.m. to 5.30 p.m.
BC - 302 : BIOCHEMISTRY
(Enzymology)

Max. Marks : 80

Note : Figures to the right indicate marks.

- Q.1 (a) Explain the general characteristics of enzymes. [04]
 (b) Discuss the enzyme classification with an example in each group. [06]
 (c) Define the following terms [04]
 (i) Enzyme turnover number
 (ii) Specific activity
 (iii) Allosteric enzyme
 (iv) Katal unit of enzyme
- OR**
- Q.1 (a) Differentiate between the following [06]
 (i) Absolute specificity Vs Group specificity
 (ii) Activators Vs Inhibitors
 (iii) Synthetases Vs Synthases
 (b) Explain the following terms [06]
 (i) Apoenzyme (ii) Metallo enzyme
 (iii) Stereospecificity (iv) Ribozyme
 (iv) Abzyme (vi) Bond specificity
 (c) Discuss the historical outlines of enzymes. [02]
- Q.2 (a) Mention the salient features of co-enzymes. [04]
 (b) How co-enzymes differ from co-factors ? [04]
 (c) Discuss the mechanism of action for carboxy peptidase. [05]
- OR**
- Q.2 (a) Discuss the significance of 'B' group vitamins in terms of enzyme reaction. [07]
 (b) Describe the co-valent catalysis. [06]
- Q.3 (a) What is enzyme purification ? Enlist the significance of enzyme purification. [06]
 (b) Write significance of following techniques in enzyme purification. [07]
 (i) Salt precipitation (ii) Dialysis
 (iii) Ion exchange chromatography
 (iv) Electrophoresis and Isoelectrofocussing
 (v) Source selection
 (vi) Gel column chromatography.
- OR**
- Q.3 (a) Enlist the factors influencing the selection of source for isolation of enzyme. [05]
 (b) Discuss the merits and demerits of enzyme purification strategies. [08]

- Q.4 (a) Enlist the factors which effect the enzyme activity. Discuss anyone in detail. [08]
(b) How Michaelis – Menters equation is derived from double reciprocal plot ? [06]

OR

- Q.4 (a) What is competitive inhibition ? Discuss its clinical significance. [05]
(b) What is allosteric regulation ? Describe its salient features. [05]
(c) Explain the term feedback inhibition with proper metabolic reaction. [04]

- Q.5 (a) Describe the industrial and pharmaceutical applications of enzymes. [05]
(b) Write the marker enzyme of major cell organelles of liver cells. [03]
(c) Discuss the uses of micro-organisms in dairy industry. [05]

OR

- Q.5 (a) Write short note on : [08]
(i) Immobilize enzymes
(ii) Significance of proteases
(b) Discuss the significance of microorganisms in production of organic acids. [05]

- Q.6 (a) Mention the clinical significance of [06]
(i) Lipase (ii) Amylase (iii) Acid phosphatase
(iv) SGOT (v) SGPT (vi) LDH
(b) Write down the uses of glucose oxide in enzyme electrodes [03]
(c) How isoenzymes analysis are useful in clinical diagnosis ? [04]

OR

- Q.6 (a) Discuss the application of enzyme therapy in cancer therapy. [07]
(b) Write down the clinical significance of [06]
(i) Body fluid (ii) Genetic diseases
(iii) Infected tissues/ Organs



SARDAR PATEL UNIVERSITY
T. Y. B.Sc. [BIOCHEMISTRY] EXAMINATION
2010
Saturday, 13th November
2.30 p.m. to 5.30 p.m.
BC-303 : INTRODUCTION OF METABOLISM

Max Marks: 80

Note: Number in parenthesis indicate marks

- Q-1 a) Write all the reactions of citric acid cycle and calculate total ATP production per turn of citric acid cycle. (10)
- b) Why glycolysis proceed about ten times faster in cancerous tissue? (04)

OR

- Q-1 Explain the reactions catalyzed and regulatory role of following enzymes in detail: (14)
- i. Pyruvate Dehydrogenase Complex (PDH complex)
 - ii. Phosphofructokinase (PFK)

- Q.2 (a) Which is the major storage tissue for lipids? Give name of enzyme/s for following biochemical reactions in this tissue – (04)
- i. To breakdown lipid
 - ii. To transform glycerol released from lipids into Dihydroxy acetone phosphate
 - iii. To Produce cAMP
 - iv. To phosphorylate and activate the lipid breaking enzyme
- (b) Describe how acetyl-CoA is brought to cytosol for fatty acid biosynthesis? (09)

OR

- Q- 2 Explain in detail fatty acid synthesis by FAS complex. How is it regulated? (13)
- Q- 3 Classify amino acids into polar, charged, nonpolar and aromatic amino acids. Also write their structures. (13)

OR

- Q- 3 Explain in detail the reactions carried out by following enzymes: (13)
- i. Carbamoyl phosphate synthetase I
 - ii. Glutamate dehydrogenase

↓

- Q.4 I Give brief account on - Catabolism of purin. 4
 II Discuss-Biosynthesis of porphyrins. 5
 III Explain – How liver bilirubin converts in to L- stercobilin. 4
- OR**
- I Write note on - Catabolism of pyrimidines 6
 II Give brief account on - Production of bile pigment. 3
 III Explain role of following amino acids and precursors in biosynthesis of nucleotides 4
 A] Aspartate. B] Carbamoyl phosphate
- Q.5 I Name the metabolic pathways you have studied and point out on major regulatory enzymes and inhibitors for **any three** path way. 7
 II Add note on any three hormonal regulator of metabolic pathway 6
- OR**
- I What do you mean by biological oxidation and oxidative phosphorylation? 3
 II Give detailed account on various complexes of phosphorylation. 6
 III Draw structure and enlist the functions for energy rich coenzymes involved in ETC. 4
- Q.6 A Explain metabolic blocks in **any three** of following disorders. Highlight on clinical manifestation 9
 I Albinism
 II Phenyl Ketonuria
 III Von Gierke's disease
 IV Maple syrup disease
- B Write note on **any one**; 4
 I] Flavanoids
 II] Terpenoids

X = X - X

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SARDAR PATEL UNIVERSITY
T.Y.B.Sc. EXAMINATION
2010

Monday, 15th November
2.30 p.m. to 5.30 p.m.

BC-304 : IMMUNOLOGY

Q.1.

- (a) Explain the term immunity. Describe the different types of Immunity. [10]
(b) What is infection ? Enlist the sources of infection. [04]

OR

- (a) Describe the features of antigen-antibody reaction. [06]
(b) Explain about primary and secondary lymphoid. [04]
(c) Define phagocytosis and enlist the biological role of phagocytosis. [04]

Q.2

- (a) What is serological reaction ? Discuss the sensitivity and specificity of serological tests. [07]
(b) What is agglutination reaction ? write the applications of agglutination. [06]

OR

- (a) Write short note on : [08]
(i) Radioimmuno assay
(ii) Applications of immunofluorescence.
(b) Write the applications of complement fixation tests. [05]

Q.3

- (a) Discuss the molecular basis diversity of antibody. [07]
(b) Explain in detail about immunology malignancy. [06]

OR

- (a) Discuss in detail about transplantation related to immunology and also describe characteristics of transplantation [10]
(b) What is histo compatibility complex ? [03]

Q.4 Define Autoimmunity and explain in detail about mechanism of Autoimmunity [13]

OR

Q.4 (A) Give brief introduction about passive immunization [08]

(B) Define Followings [05]

- (i) Tolerance
- (ii) Hypersensitivity
- (iii) Autoimmune diseases
- (iv) Vaccination
- (v) Active immunity.

Q.5 Give brief comments on Followings [14]

- (i) Fibrinogen is essential clotting factor
- (ii) Albumin is key plasma protein
- (iii) Blood is liquid connective tissue
- (iv) Erythrocyte is simplest cell.
- (v) RBC becomes more fragile in hypotonic medium .
- (vi) Arterial blood is bright crimson but venous blood is a darker red.
- (vii) HDL is good lipoprotein

OR

Q.5

(a) Discuss in detail about chemistry and importance of albumin. [08]

(b) Explain various functions of plasma proteins [06]

Q.6

(a) Discuss about various principal clotting factors with their functions. [07]

(b) Explain the role of blood platelets in blood clotting process. [06]

OR

Q.6 Write notes on following. [13]

- (i) Chemistry of Hb.
- (ii) Properties of Hb.
- (iii) Hemolytic Anemia.

[139]

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SARDAR PATEL UNIVERSITY

T. Y. B. Sc. EXAMINATION

2010

Tuesday, 16th November

2.30 p.m. to 5.30 p.m.

BC-305 : HUMAN PHYSIOLOGY AND CLINICAL ENDOCRINOLOGY

Total Marks : 80

Q.1

- (A) Write your comments on followings: [10]
- (i) Surfactants are useful chemical component.
 - (ii) Only 10% CO₂ is transport in the form physical solution.
 - (iii) The heart is a muscular pump.
 - (iv) Circulatory system is important in cellular respiration.
 - (v) Sinatrial node is known as pacemaker of heart.

- (B) Write notes on chambers of heart. [04]

OR

Q.1

- (A) What are respiratory gases ? Describe in detail about CO₂ transport in blood. [11]

- (B) Explain normal blood pressure is very important for normal health. [03]

Q.2

- (A) Explain in brief. [10]
- (i) Digestion begins in the mouth.
 - (ii) Stomach can not digest carbohydrates.
 - (iii) Liver is essential organ for digestive process.
 - (iv) Maculadena is very important spot.
 - (v) Mesangial cells are important cells.

- (B) Explain in brief kidney play important role in Acid-Base balance. [03]

OR

Q.2

- (A) Write notes on composition of gastric juice. [03]

- (B) What are three steps of Urine formation. Describe in detail about mechanism of glomerular filtration. [10]

Q.3 Write answer of followings:

- (i) What is clinical importance of organ functions tests ? [03]
- (ii) Explain Muscle is rich source of proteins. [03]
- (iii) Myoglobin is known as hemoglobin of muscle. [04]
- (iv) explain about Actomyosin complex. [03]

OR

Q.3
(A) What are various abnormal constituents of Urine. [02]

(B) Describe in detail about sliding filament theory of muscle contraction. [11]

Q.4 Write short note on : (Any Two) [14]

- (i) Functions of Neurons**
- (ii) Role of acety choline**
- (iii) Structure and classification of neuro transmitter**
- (iv) Role of Dopamine and serotonin**

Q.5 Describe in detail (Any Two) [13]

- (i) Mechanism of hormone action for water soluble hormones.**
- (ii) Hormone receptors**
- (iii) Endocrine glands and organs of body and their hormonal secretion.**
- (iv) Regulation of hormone secretion**

Q.6 Write the functions of following hormones (Any Two) [13]

- (i) Thyroid hormone**
- (ii) Anti diuretic hormone**
- (iii) Aldosterone**
- (iv) Cortisol**

SARDAR PATEL UNIVERSITY
T.Y.B.Sc. (Biochemistry) EXAMINATION
2010

Thursday, 18th November
2.30 p.m. to 5.30 p.m.

BC-306 : Microbial Biochemistry and Fermentation Technology

Maximum Marks : 80

Note: Number in parenthesis indicate marks

SECTION - I

- Q-1 Explain **any two** of the following: **(12)**
- a. Gram-Negative Cell Walls
 - b. Biosynthesis of Peptidoglycan
 - c. Action of antibiotics on cell wall of prokaryotic organisms
 - d. Differential ATP synthesis, transcription and protein anabolism in prokaryotic organisms compared to eukaryotic organisms
- Q-2 (a) Give examples and classify viruses. **(09)**
- (b) Group following microorganisms into different kingdom as per the recent classification system. **(05)**
1. Bacteria
 2. Yeast
 3. Fungi
 4. Halophiles
 5. Protozoa

OR

- Q-2 Answer the following questions in brief: **(14)**
1. Give an example of a bacterial name and write it in its proper form.
 2. What are we comparing in rRNA oligonucleotide cataloguing?
 3. If the two microorganisms have an identical mol % G+C value for their DNA, are they necessarily related?
 4. What is type strain?
 5. Define Taxon.
 6. Which is the international reference for identification and classification of bacteria?
 7. Define Plaque forming units.

- Q- Define microbial growth and describe various methods to measure growth of microbes **(14)**

OR

- Q-3 (a) What is synchronous culture? What is its importance and how can one achieve synchronous culture? **(08)**
- (b) Suppose the generation time of a bacterium is 90 minutes and the initial number of cells in a culture is 10^3 cells at the start of the log phase. How many bacteria will there be after 8 hours of exponential growth? **(06)**

(1)

Q.4 A Give meaning for primary and secondary screening and explain primary screening methods **14**

OR

i Highlight on Component parts of fermentation process. **5**

ii Discuss- How will you isolate industrially important microorganisms **9**

Q.5 A Give meaning and process for following terminology: **8**
1] malting 2] Wort 3] brewing 4] condensation

B Explain – Gluten is an important biomolecule for baking industry. **5**

OR

A Give brief account on

i Importance of hops **4**

ii Leaveners in baking industries **3**

B Basic steps for the production of vinegar. **6**

Q.6 Answer any two: **13**

A Enlist fermented milk products and discuss process to obtain yoghurt.

B What is soybean? Explain stepwise method to obtain good soy cheese.

C Give brief account on starter and fermentation of Soya sauce.

D Discuss a product obtain by fermentation of Grapes

X=X=X

(2)