

Subject : Microbiology-I

Day : Thursday

Date : 06/04/2017



34732

Time : 10.00 AM TO 01.00 PM

Max Marks : 80 Total Pages : 2

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the section should be written in **SEPARATE** answer books.
- 4) Neat diagrams must be drawn **WHEREVER** necessary.

SECTION-I

Q.1 A) Answer any **ONE** of the following: (06)

- i) Explain cell wall of Gram negative bacteria.
- ii) Discuss contributions of Louis Pasteur in brief.

B) Answer any **TWO** of the following: (10)

- i) Describe phylogenetic classification of bacteria.
- ii) Explain the structure of flagella.
- iii) Discuss mechanism of Gram staining technique.

Q.2 Write short notes on any **FOUR** of the following: (16)

- a) Koch's postulates
- b) Differential media
- c) Capsule in bacteria
- d) General characteristics of Actinomycetes
- e) Different shapes of bacteria

SECTION-II

Q.3 A) Answer any **ONE** of the following: (06)

- i) Discuss heat as a method of sterilization.
- ii) Explain the role of microorganisms with reference to bio-pesticides.

B) Answer any **TWO** of the following: (10)

- i) Give an account of various types of growth media for bacterial isolation.
- ii) Write a note on mode of action of heavy metals.
- iii) Explain principle and applications of SEM.

P. T. O.

Q.4 Answer any **FOUR** of the following: (16)

- a) Give an account of fluorescence microscopy.
- b) Explain different types of bacteria on the basis of preferable carbon source for its nutrition.
- c) Give various applications of Probiotics.
- d) Discuss membrane filters used for sterilization.
- e) What is selective medium? Discuss various types of selective media used for bacterial isolation.

Q.5 Answer All **EIGHT** of the following: (16)

- a) Define chemo-organotrophs.
- b) Enlist different pure culture techniques.
- c) What are chemical indicators?
- d) Define biofertilizers with examples.
- e) Define the term Astigmatism.
- f) How does immersion oil increase resolution?
- g) What is the role of yeast in bakery fermentation?
- h) Discuss various arrangements of flagella.

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Subject : Biochemistry-I

Day : Saturday
Date : 08/04/2017



Time : 10.00 AM TO 01.00 PM
Max Marks : 80 Total Pages : 2

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw diagram **WHEREVER** necessary.
- 4) Both the sections should be written in the **SEPARATE** answer books.

SECTION - I

Q.1 a) Attempt any **ONE** of the following: **(06)**

- i) Define carbohydrates. Explain their classification based on the number of monomeric units giving one suitable example of each class.
- ii) Why carbon atom is abundantly present in all biomolecules? Describe the properties of carbon atom which makes it an important atom for life.
- iii) What are proteins? Explain various biological functions of proteins with suitable example. Define the term conformation and configuration.

b) Attempt any **TWO** of the following: **(10)**

- i) Describe primary, secondary, tertiary and quaternary structures of proteins.
- ii) Explain the phenomenon of 'mutarotation' and the term 'epimers' with suitable examples.
- iii) Why water is referred as 'universal solvent'. Explain various non-covalent interactions in biomolecules with suitable example.

Q.2 Attempt any **FOUR** of the following: **(16)**

- a) Draw the structure of any one polar, non-polar, aromatic and acidic amino acid.
- b) Describe the titration curve of a simple amino acid along with the term **PI**.
- c) Differentiate between glucose and fructose.
- d) Write short note on 'glycoconjugate'.
- e) Explain the importance of biochemistry in the field of biotechnology.

P.T.O.

SECTION - II

Q.3 a) Attempt any **ONE** of the following: (06)

- i) Describe the classification of lipids with suitable example. Differentiate between saturated and unsaturated fatty acids.
- ii) Discuss in detail the Watson and Crick model of DNA.
- iii) What are vitamins? Describe the classification of vitamins with suitable example.

b) Attempt any **TWO** of the following: (10)

- i) What is RNA? Describe their various types, structures and functions.
- ii) What are macronutrients and micronutrients? Explain the role of any four minerals in biological system.
- iii) Describe structure and functions of cholesterol.

Q.4 Attempt any **FOUR** of the following: (16)

- a) Write a note on denaturation and renaturation of DNA.
- b) Write a note on purines and pyrimidine bases with their structures.
- c) Differentiate between oil and fats. Give the structure of an example of each.
- d) Write a note on eicosinoids.
- e) Explain the role of lipid as signal, cofactor and pigment molecule.

Q.5 Attempt any **EIGHT** questions. (16)

- a) Which amino acids show absorbance at 280 nm? Why?
- b) Draw structure of any one of reducing and non-reducing sugar.
- c) Write the complementary sequence of AAGCCTACGA.
- d) Draw the structure of D-glyceraldehyde (Perspective formula) and lactose.
- e) Name various factors which can denature proteins.
- f) Give two examples each of saturated and unsaturated fatty acids.
- g) Draw the structure of Ala – Ser – Tyr – Gly. Label N and C terminals of the peptide.
- h) Explain – Zwitter ion.
- i) Name the storage organs where glycogen and starch are stored in animals and plants.
- j) Differentiate between DNA and RNA.

Subject : Cell Biology

Day : Monday

Date : 10/04/2017



34734

Time : 10.00 AM TO 01.00 PM

Max Marks : 80 Total Pages : 2

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 2) Answers to both the sections should be written in **SEPARATE** answer book.
- 3) Draw neat diagrams **WHEREVER** necessary.

SECTION-I

Q.1 A) Attempt any **ONE** of the following: **(06)**

- i) Differentiate between prokaryotic cell and eukaryotic cell.
- ii) Describe in brief the structure and functions of mitochondria.

B) Attempt any **TWO** of the following: **(10)**

- i) Describe structure of plant cell and explain how it differs from animal cell.
- ii) Describe the structure of endoplasmic reticulum.
- iii) Describe the ultra structure of chloroplasts.

Q.2 Write notes on any **FOUR** of the following: **(16)**

- a) Structure of microtubule
- b) Functions of nucleus
- c) Structure and functions of lysosome
- d) Tight junctions
- e) Types of cell signaling

SECTION-II

Q.3 A) Attempt any **ONE** of the following: **(06)**

- i) What is active transport? Explain structure and mechanism of Na⁺ and K⁺ pump.
- ii) Describe the structure of fluid mosaic model of plasma membrane.

B) Attempt any **TWO** of the following: **(10)**

- i) What is cell cycle? Describe interphase of cell cycle.
- ii) Describe stages of mitosis.
- iii) What is apoptosis? Explain how it differs from necrosis.

P. T. O.

Q.4 Write notes on any **FOUR** of the following: (16)

- i) Mechanism of passive transport. .
- ii) Ligand and voltage gated channels.
- iii) Oogenesis.
- iv) Simple diffusion and facilitated diffusion
- v) Function of Microfilaments

Q.5 Attempt any **EIGHT** of the following: (16)

- i) Cell size and shape.
- ii) Differentiate between desmosomes and hemidesmosomes.
- iii) Define ligand receptor.
- iv) Sketch and label structure of mitochondria.
- v) Write importance of meiosis.
- vi) Types of plastids and their role.
- vii) Ca^{++} ATPases
- viii) F_1 particle of mitochondria
- ix) Mention different cytoskeleton elements with their size
- x) Role of plasmodesmata in plants
- xi) Explain the term extracellular matrix.
- xii) Signal transduction
- xiii) Ionophores

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