

**Subject : Cell Biology**

Day : Friday

Date : 14/10/2016



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) Describe the structure of mitochondria and add a note on its functions.
  - ii) Describe the structure and functions of microtubule.
- B)** Attempt any **TWO** of the following: (10)
- i) Describe in brief the structure chloroplast.
  - ii) Describe ultra-structure of endoplasmic reticulum and add a note on its functions.
  - iii) Describe typical structure of animal cell.
- Q.2** Write notes on any **FOUR** of the following: (16)
- a) Types and functions of different blood cells
  - b) Structure of neuron and muscle cell
  - c) Tight junctions
  - d) Intermediate filament proteins
  - e) Cell signaling mechanism

**SECTION-II**

- Q.3 A)** Attempt any **ONE** of the following: (06)
- i) Differentiate between passive transport and active transport with suitable examples.
  - ii) Describe fluid mosaic model of plasma membrane and explain how it differs from previous models.
- B)** Attempt any **TWO** of the following: (10)
- i) Describe interphase of cell cycle.
  - ii) Explain various stages of prophase -1 in meiosis.
  - iii) What is apoptosis? Explain mechanism of apoptosis.

P. T. O.

- Q.4** Write notes on any **FOUR** of the following: **(16)**
- i) Functions of microfilaments
  - ii) Spermatogenesis
  - iii) Importance of ion selective channels
  - iv) Exocytosis and endocytosis mechanism
  - v) Types of meiosis
  - vi) Gap junctions
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- Q.5** Attempt any **EIGHT** of the following: **(16)**
- i) What is desmosomes?
  - ii) Explain cell theory.
  - iii) Mention components of cytoplasm.
  - iv) Structure of phospholipids in membrane.
  - v) Write role of electron transport particles (ETP) in mitochondria.
  - vi) What is mean by Ouibain?
  - vii) Explain receptor mediated endocytosis.
  - viii) Define gametogenesis and spermiogenesis.
  - ix) Sketch and label metaphase of mitosis.
  - x) 'S' phase of cell cycle.
  - xi) What is necrosis?
  - xii) Different types of plastids.
  - xiii) Plasmodesmata

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## Subject : Biochemistry-I

Day : Thursday

Date : 13/10/2016



31425

Time : 10.00 AM TO 01.00 PM

Max Marks : 80 Total Pages : 1

## N. B. :

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

## SECTION - I

- Q. 1 A) Attempt **ANY ONE** of the following: (06)
- i) Define carbohydrates. Explain their classification based on number of monomeric unit with example.
  - ii) Describe primary, secondary, tertiary and quaternary structures of proteins.
- B) Attempt **ANY TWO** of the following: (10)
- i) Explain glycoprotein, glycolipid and proteoglycan with suitable example.
  - ii) Explain- why carbon atom is so versatile in nature.
  - iii) Describe briefly the various biological functions of proteins.
- Q. 2 Attempt **ANY FOUR** of the following: (16)
- i) Describe the titration curve of a simple amino acid along with the term pI.
  - ii) Differentiate between glucose and fructose.
  - iii) Explain mutarotation with suitable example. Define the term- epimers.
  - iv) Write short note on non-covalent bonds in biomolecules.
  - v) Why water is called as 'Universal solvent'?

## SECTION - II

- Q. 3 A) Attempt **ANY ONE** of the following: (06)
- i) What are lipids? State the importance of phospholipids?
  - ii) Describe Watson and Crick model of DNA.
- B) Attempt **ANY TWO** of the following: (10)
- i) Explain denaturation and renaturation of DNA.
  - ii) What are vitamins? Explain deficiency and functions of any four vitamins
  - iii) What is RNA? Describe their various types, structure and functions.
- Q. 4 Attempt **ANY FOUR** of the following: (16)
- i) Describe the structure and functions of cholesterol.
  - ii) What are macronutrients and micronutrients? Explain the role of any four minerals.
  - iii) Write a note on lectin.
  - iv) Explain the role of lipid as signal cofactor and pigment molecules.
  - v) Differentiate between nucleoside and nucleotide.
- Q. 5 Answer **ANY EIGHT** of the following: (16)
- i) Name three essential amino acids.
  - ii) Which amino acids show absorbance at 280 nm? Why?
  - iii) Explain: Zwitter ion.
  - iv) Name the storage organs where glycogen and starch are stored in animals and plants.
  - v) Draw the structure of Gly-Ala-Ser-Tyr and label the N and C terminals.
  - vi) Give two examples of acidic and aromatic amino acids.
  - vii) Draw the structure of D-glyceraldehyde (perspective formula) and lactose.
  - viii) Give two examples each of saturated and unsaturated fatty acids.
  - ix) Name various non-covalent bonds present in biomolecules.

**Subject : Microbiology-I**

Day : Monday

Date : 10/10/2016



31424

Time : 10.00 AM TO 01.00 PM

Max Marks : 80 Total Pages : 1

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate full marks.
- 3) Both the sections should be written in **SEPARATE** answer books.

**SECTION-I**

- Q.1** A) Answer any **ONE** of the following: (06)
- i) Explain the structure of peptidoglycan in cell wall of Gram positive bacteria.
  - ii) Explain the role of microorganisms in genetic engineering.
- B) Answer any **TWO** of the following: (10)
- i) Give an outline of Bergey's manual of systematic bacteriology.
  - ii) Discuss the structure of a procaryotic cell in brief.
  - iii) Explain Francisco Redi's experiment that disproves the theory of spontaneous generation.
- Q.2** Write short notes on any **FOUR** of the following: (16)
- i) Koch's postulates
  - ii) Sporulation in bacteria
  - iii) Numerical taxonomy
  - iv) Sero var and Morphovar
  - v) Characteristics of Actinomycetes

**SECTION-II**

- Q.3** A) Answer any **ONE** of the following: (06)
- i) Explain working and applications of Fluorescence Microscope.
  - ii) Define sterilization. Elaborate filtration as a method of sterilization.
- B) Answer any **TWO** of the following: (10)
- i) Give an account of SEM.
  - ii) Discuss the role of microorganisms in bio-pesticides.
  - iii) Define pure culture. Explain spread plate technique in detail.
- Q.4** Answer any **FOUR** of the following: (16)
- i) Explain various types of bacteria on the basis of sources of nutrition.
  - ii) Explain the mode of action and applications of ionizing radiations in sterilization.
  - iii) Discuss Nitrogen fixing bacteria with reference to bio-fertilizers.
  - iv) What is the role of biological indicators in monitoring sterilization?
  - v) Draw a ray diagram of Bright Field Microscope.
- Q.5** Write short notes on any **FOUR** of the following: (16)
- i) Differential media
  - ii) GM *E-coli* for insulin production
  - iii) Mode of action of halogens
  - iv) Chromatic Aberrations
  - v) Photoautotrophs