

2016

B.Sc. (Hons.) Bio-Technology (FYUP)-1st Semester
BCHM101: Biomolecules-I

Time allowed: 3 Hours

Max. Marks: 60

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting one question from each Unit.

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I. Name the following:-

- a) Major buffer system of erythrocytes.
- b) Type of bonds through which water crystallizes in the solid state.
- c) Substances that yields both protons and hydroxyl groups in aqueous solutions.
- d) Carbohydrates combined to form the repeating unit of hyaluronic acid.
- e) Glycosidic linkage present in cellulose.
- f) A non-reducing sugar other than sucrose.
- g) Two lipids that do not contain glycerol.
- h) Ring structure present in cholesterol.
- i) Fatty acid with 18 carbon and 3 double bonds.
- j) Amino acids present in bile acids.
- k) Repetitive unit of terpenoids.
- l) Hormone that inhibits FSH production in a female mammal. (12×1)

UNIT - I

- II. a) What is the pKa for an acid HA that is 50% ionized in 0.2 M solution?
b) Explain why a polar molecule such as glucose is soluble in water.
c) Derive Handerson Hassel balch equation. (3,3,6)

- III. a) What are acid-base indicators? How these indicators work?
b) Write a note on dialysis.
c) Define buffer. Name any two physiological buffers. (5,4,3)

UNIT - II

- IV. a) Describe classification of carbohydrates. Give examples of each class.
b) Define epimer and anomer. Give examples with structures.
c) Discuss the process of mutarotation. (5,4,3)

- V. a) Write down biological importance of storage polysaccharides in plants and animals.
b) Why maltose is a reducing sugar while sucrose is not?
c) Discuss the following reactions with structures
(i) Reaction of glucose with hydrogen cyanide
(ii) Reaction of glucose with phenyl hydrazine (5,2,5)

P.T.O.

(2)

UNIT – III

- VI. a) What are fatty acids? How they are classified? Give example for each class.
b) Define saponification number, peroxide value, and give their significance?
c) Write a note on waxes. (5,4,3)
- VII. a) Give different classes of lipids with examples.
b) Write a short note on gangliosides.
c) Enlist the major differences between animal and plant fats. (5,4,3)

UNIT - IV

- VIII. a) Classify lipoproteins and their biological functions.
b) Write a note on mycosterols.
c) Draw the structure of any plant sterol. (6,4,2)
- IX. a) Describe the chemical nature and physiological significance of bile pigments.
b) Describe the structure and properties of leukotrienes.
c) Name any two color reactions for sterols. (5,5,2)

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