BIYANI GIRLS COLLAGE

Model test paper -1

M.Sc final year(Chemistry)

Paper-2

Bioinorganic, Bioorganic & Biophysical Chemistry

Unit-1

Time:-3 max marks:-75

Que.1. a) Discuss in detail the DNA polymerization and possible mechanism of replication of DNA.

b) Discuss the role of Zn in biological systems? (10+5)

OR

Que.2. What are bulk and trace elements? Discuss the importance of Na, K and Cu in biological systems? (5+10)

Unit-II

Que.3. Write the brief note on the structure and function of metalloprotein and cytochromes in electron transport processes? (8+7)

OR

Que.4. a) Discuss the use of site directed mutagenesis?

b) Mechanism of action of chymotrypsion? (5+10)

Unit-III

Que.5. What are coenzymes? Discuss the structure and biological functions of NAD^+ and Lipoic acid? (2+13)

OR

Que.6. Discuss the biotechnological applications of enzymes and their production and purification. (15)

Unit-IV

Que.7. What are exergonic and endergonic reactions? Give a brief account of protein folding. (8+7)

OR

Que.8. Write short notes on following (any three)-

a) Helix coil transition
b) Forces involved in biopolymer interactions
c) Chain configuration of macromolecules
d) Structure and function of RNA (5+5+5)

Unit-V

Que.9. Discuss the structure and various functions of a cell membrane. Explain the thermodynamic treatment of membrane transport (15)

OR

Que.10. Write short notes on following-

a) Sedimentation equilibrium
b) Electrophoresis
c) X-Ray diffraction methods in studying crystal structure of biopolymers. (5+5+5)

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Model test paper-2

M.sc final year (chemistry)

Paper - 2

Bioinorganic, Bioorganic & Biophysical Chemistry

Time:-3 Max marks:-75

Unit-I

Que.1. What do you mean by photosynthesis? Explain in detail. Also explain the photosystem I and photosystem II in cleavage of water. (5+5+5)

or

Que.2. Discuss the structural features of haemoglobin. How does it compare with myoglobin? Briefly explain their role in transporting O_2 in living cells. (5+5+5)

Unit II

Que.3. What do understand by Michaelis Mention theory? Discuss its application in studying enzyme catalysed reactions. (10+5)

or

Que.4. Write short notes on following (any three)-

a) Affinity labelling and active site of enzyme
b) Acid base catalysis
c) Enzyme catalysed carboxylation and decarboxylation
d) β-cleavage and condensation reaction (5+5+5)

Unit-III

Que.5. a) Write a short note on the biomimetic chemistry of crown ether and cyclodextrins.
b) Calixarenes as enzyme model. (8+7)

or

Que.6. Write short notes on following-

a) Recombinent DNA technology
b) Synzymes
c) Clinical uses of enzymes (5+5+5)

Unit-IV

Que.7. How is primary structure of DNA established? What is the role of DNA with respect to protein synthesis in a cell? (7+8)

or

Que.8. What do you understand by standard free energy change in biochemical reactions? Discuss the synthesis of ATP from ADP and its hydrolysis. (7+8)

Unit-V

Que.9. a) What is light scattering? Explain the phenomenon and its application in determining the molar mass of biopolymers.

b) Explain briefly the determination of molar mass of a biopolymer by sedimentation equilibrium method. (8+7)

or

Que.10. Write short notes on following (any three)-

a) Nerve conduction
b) Determination of the size of biopolymers
c) Thermodynamics of biopolymer solutions
d) Ion transport through cell membrane (5+5+5)

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MODEL TEST PAPER-1

M.Sc final year (chemistry)

paper-7

Chemistry of Natural Products

Unit-I

Que.1. Write short notes on following-

a) Presence of an α, β-unsaturated oxo group in citral.
b) Graded oxidation (by alk. $KMnO_4$) of α-terpineol (Wallach's work)
c) Ozonolysis of zinzigerene
d) Ozonolysis of phytol
e) Position of carboxylic acid group in abietic acid. (2×5)

or

Que.2. a) Write a short note on the isolation of terpenes. How can the terpenes be purified from essential oils?

b) How will you establish the presence of double bond, tertiary nature of alcohol (OH) group and position of the double bond in α-terpineol? (4+6)

Unit-II

Que.3. How will you establish the following-

a) Presence of pyrrolidine nucleus in nicotine.
b) Presence of a piperidine nucleus with side chain at 2-position in coniine.
c) Presence of a methoxy group in quinine.
d) Presence of a phenanthrene moiety in morphine.
e) Presence of a reduced pyridine nucleus in tropine. (2×5)

or

Que.4. a) Choosing pyridine as an example, show how the Hofmann's exhaustive methylation technique opens up the heterocyclic ring. Is this technique applicable to all heterocyclic rings?

b) Give the synthesis of atropine. (10)

Unit-III

Que.5. Briefly review the Chemistry of Sex Hormones (synthesis is not required) and their physiological significance. (10)

or

Que.6. Discuss the following-

a) Barier – Wieland degradation
b) Diel's Hydrocarbon
c) Total synthesis of Estrone by Torogov. (10)

Unit-IV

Que.7. a) Discuss the biosynthesis of flavonoids.
b) Describe the isolation and functions of anthocyanins. (5+5)

or

Que.8. a) How will you establish the presence of four pyrrole nucleus in haemin that are linked together? (5)
b) How will you obtain chlorine from chlorophyll-a. Write the structure formulae of chlorophyll-a, chlorophyllide-a, pheophorbide-a and chlorine. (3+2)

Unit-V

Que.9. Discuss the chemistry of rotenones. Give its synthesis also. (10)

or

Ques.10. a) Write a note on the biogenesis of prostaglandins and discuss their classification with example.
b) Describe the physiological importance of prostagalanis. (6+4)

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MODEL TEST PAPER-2

M.Sc final year(chemistry)

paper -7

Chemistry of Natural Products

Time:-3 Marks:-50

Unit-I

Que.1. a) Give two examples of the application of UV spectroscopy in elucidation the structure of terpenoids.

b) What is the importance of Graded Oxidation Technique in structure determination of terpenoids? Give examples. (10)

or

Que.2. How will you establish the following in the structure of citral-

i. Presence of two double bond
ii. Presence of an oxo group
iii. Presence of an α, β-unsaturated oxo group
iv. Presence of a methyl and an isopropyl group. (10)

Unit-II

Que.3. Describe the importance of these techniques in the structure elucidation of alkaloids-

a) Hofmann's exhaustive methylation
b) Emde degradation
c) Herzing-meyers method
d) Von Braun's method (10

or

Que.4. How will you establish-

a) Presence of pyridine nucleus in nicotine
b) Presence of n-propyl chain in coniine
c) Presence of quinoline ring in quinine
d) Presence of three oxygen atoms in morphine
e) Conversion of morphine to apomorphine (2×5)

Unit-III

Que.5. Discuss the chemistry and biolofical significance of progesterone. (10)

or

Que.6. Write short note in following-

a) Biosynthesis of steroids
b) Nomenclature of steroids

c) Presence of cyclopentenophenanthrene nucleus in cholesterol. (10)

Unit-IV

Que.7. a) Review the chemistry of daidzain and cite its Baker-Ollis synthesis.

b) What are KOH fusion products of quercetin and how is it converted to cyaniding chloride. (5+5)

or

Que.8. a) Structural formulae for chlorophyll-a and chlorophyll-b. How is the Mg removed from cholorophyll and what is the resulting product.

b) Explain the chemical changes that occur when haemin is treated with tin and hydrochloric acid. (5+5)

Unit-V

Que.9. What are prostaglandins? What are "Primary" prostaglandins? Explain their important metabolites. (10)

or

Que.10. a) What are pyrethroids? Give synthesis of any one of them.

b) Provide a synthesis of PGE_2 developed by E. J. Corey. (5+5)