MANIPAL
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Reg. No.										

DEPARTMENT OF SCIENCES, IV SEMESTER M.Sc (CHEMISTRY) END SEMESTER EXAMINATIONS, APRIL 2018

Subject: BIOORGANIC AND MEDICINAL CHEMISTRY [CHM 704] (REVISED CREDIT SYSTEM)

Time: 3 Hours Date:19-04-2018 MAX. MARKS: 50

Note: (i) Answer any FIVE FULL questions

(ii) Draw diagrams, and write equations wherever necessary

1A. i) Explain the four structural levels of proteins.
ii) Discuss any four salient features of active site of an enzyme.
1B. Discuss the synthesis and mechanism of action of fluorouracil.
1C. Differentiate between the following;
i) Cerebroside and ganglioside
ii) Koshland's model and substrate strain theory of enzymes

(6+2+2)

2A. i) Justify the following statements;
a) K_m value of succinate dehydrogenase catalyzed reaction increases in presence of malonic acid.
b) Glycerol tripalmitate is a solid at room temperature.
c) The peptide linkage in proteins is transplanar.
d) Urease exhibits absolute substrate specificity, whereas hexokinase shows broad specificity.
ii) Discuss the structural similarities and dissimilarities of DNA and RNA.
2B. What are aminoglycoside antibiotics? Give any three advantages of chloramphenicol.
2C. Give two limitations of narcotic analgesics? What are narcotic antagonists? Discuss the synthesis of Nalorphine.

(6+2+2)

3A.i) Explain the synthesis of the following drugs;
a) Trimethadione b) methyldopa
ii) Explain hydrolytic and oxidative rancidity exhibited by fats and oils with suitable examples.
3B. Explain the mechanism of action of group-1 hormones.
3C. What are the advantages of NSAIDs? Discuss the synthesis and uses of Ibuprofen.

(6+2+2)

4A. i) What are drug-receptor interactions? Explain different types of binding forces exist in drug-receptor interactions.

ii) Discuss the importance of drug solubility in drug design. Explain the structural modification methods to improve the drug solubility.

4B. Discuss the significance of pKa and geometrical isomerism respectively as physiological properties of drug molecules in relation to their biological activities.

4C. Describe the occupancy theory of drug action in detail.

(6+2+2)

5A. i) Write a brief note on the basic concept of prodrug with illustrative examples.

ii) Differentiate between the following:

a) Anabolism and catabolism
b) Tubular secretion and tubular reabsorption
c) Swallowed type and sublingual type of medications

5B. Explain the characteristics of different routes of drug administration.

5C. Justify the following:

i) Urine is considered as a potential diagnostic tool.

ii) Glomerular filtration rate is often measured with the help of renal clearance of insulin.

(6+2+2)

6A. i) How partition coefficient affects the biological activity of a drug? Explain two methods of measuring lipophilicity.

ii) Explain the following:

a) Bioavailability of a drug
b) Charnier's theory of drug action
c) Energy values of food

6B. Discuss the factors affecting the drug distribution.

6C. Write procedures for the estimation of hemoglobin and uric acid respectively in the blood.

(6+2+2)

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