

CHE 602.2(R)

Reg. No.

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**CREDIT BASED SIXTH SEMESTER B.Sc. DEGREE EXAMINATION - APRIL
2012**

CHEMISTRY
ELECTIVE – II: BIOLOGICAL CHEMISTRY

Duration: 3 hours

Max marks: 70

PART A

1. Answer any TEN of the following:

1x10=10

- a) State Isoprene rule.
- b) What happens when citral is heated with potassium bisulphate?
- c) Write the chemical structure of Guanine.

- d) State the uses of Uracil.
- e) Define the term ‘affinity’ in medicinal chemistry.
- f) What is an enzyme inhibitor?
- g) What are analgesics?
- h) Write the structure of paracetamol.
- i) What are biosensors?
- j) Define the term “zwitterion”.
- m) What is protein denaturation?
- n) What is the biological role of Zn^{2+} ion?

PART-B
UNIT-I

Answer any TWO of the following.

10x2=20

- | | | | |
|----|----|---|----|
| 2. | a) | How are tepenoids isolated? Explain | 02 |
| | b) | Outline the chemical synthesis of barbituric acid. | 03 |
| | c) | How was the structure of coniine arrived at? | 05 |
| 3. | a) | Write the structure of an acyclic and a cyclic ureide. | 02 |
| | c) | Write a note on Hofmann’s exhaustive methylation method. | 03 |
| | d) | Elucidate the structure of menthol. | 05 |
| 4. | a) | Give the classification of alkaloids. | 02 |
| | b) | How do you show that N-Methylpyrrolidine moiety is linked to pyridine ring in nicotine? | |
| | c) | Give a method of synthesis of the following. | 05 |
| | | a) Adenine b) Uracil | |

UNIT-II

Answer any TWO of the following.

10x2=20

- | | | | |
|----|----|---|----|
| 5. | a) | Give the synthesis of chloramine -T | 02 |
| | b) | What are prodrugs? Describe with an example. | 03 |
| | c) | What are the different approaches to drug synthesis? Discuss. | 05 |
| 6. | a) | Outline the synthesis of antipyrine. | 02 |
| | b) | What are disinfectants and antiseptics? Give an example for each. | 03 |

- c) Explain the classification of drugs based on chemical structures.
05
7. a) What are agonists and antagonists?
02
- b) Distinguish between sedatives, hypnotics and tranquillizers.
03
- c) Explain briefly the various pharmacokinetic steps.
05

UNIT-III

Answer any TWO of the following.

2x10=20

8. a) Classify the following amino acids as neutral, acidic and basic amino acids.
Glycine, Tyrosine, Aspartic acid, Arginine 02
- b) Describe Gabriel Phthalimide synthesis of amino acids. 03
- e) Discuss any two methods for the determination of C-terminal of amino acid. 05
9. a) Explain the tertiary structure of proteins.
- b) Give the synthesis of Vitamin-A
- c) Describe various types of protecting agents used in the synthesis of peptides. 05
10. a) What are essential and non essential amino acids? Give an example for each.
- b) Describe Erlenmeyer Azalactone Synthesis of Phenyl alanine. 03
- d) Discuss briefly the structure and functions of haemoglobin. 05

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CREDIT BASED SIXTH SEMESTER B.Sc. DEGREE EXAMINATION - APRIL
2013

CHEMISTRY

ELECTIVE – II: BIOLOGICAL CHEMISTRY

Duration: 3 hours

Max marks: 80

PART A

1. Answer any TEN of the following:

2x10=20

- a) Give the structure of coniine.
- b) How is methoxy group detected in an organic compound?
- c) How many isoprene units are present in menthol. Explain by writing its structure.
- d) How is purine synthesized?
- e) What is phase II metabolism?
- f) What are drug receptors?
- g) What is semisynthetic drug? Give an example.
- h) What are membrane active drugs?
- i) Write the zwitter ion structure of tryptophan and tyrosine.
- j) Mention the deficiency disease caused by vitamin A & C.
- o) Explain the role of selenium and cobalt in biological systems.
- p) Write the possible number of tripeptides that can be obtained by the following amino acids
i) glycine ii) phenylalanine iii) cysteine

PART-B

UNIT-I

Answer any TWO of the following.

10x2=20

2. a) Elucidate the structure of nicotine and give its synthesis. 07
- b) What is isoprene rule? Illustrate with an example. 03
3. a) Write the chemical synthesis of
i) uracil ii) caffeine iii) uric acid 07
- e) Outline the synthesis of menthol.
4. a) How is the structure of coniine established and give its synthesis? 07
- b) Explain the synthesis of barbituric acid.

UNIT-II

Answer any TWO of the following.

10x2=20

5. a) Explain the concept of drug receptors with suitable examples.
03
- b) Give the synthesis of antipyrine.
03
- c) Write notes on : i) affinity of drugs ii) therapeutic index
04
6. a) Explain briefly the various pharmacokinetic steps.
05
- b) Write a note on drug metabolism.
05
7. a) Explain the classification of drugs with examples.
06
- b) Write the synthesis of sulfapyridine and paracetamol.

UNIT-III

Answer any **TWO** of the following.

2x10=20

8. a) Explain the terms isoelectric point and electrophoresis. 04
- f) Discuss any two methods of preparation of ~~α~~-amino acids. 06
9. a) Write a note on solid phase synthesis of peptides.
- b) What are primary, secondary and tertiary structures of proteins? Explain.
10. a) Outline the chemical synthesis of vitamin A.
- b) Write a note on metalloporphyrins. 04

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CREDIT BASED SIXTH SEMESTER B.Sc. DEGREE EXAMINATION APRIL 2014

CHEMISTRY

PAPER VII: GENERAL CHEMISTRY

Duration: 3 hours

Max marks: 80

PART A

1. Answer any **TEN** of the following:

10x2=20

- a) Mention any two characteristic properties of alkaloids.
- b) Give an example each for pyridine and pyrrolidine alkaloids and write their structure.
- c) Explain isoprene rule.
- d) How is urea converted into barbituric acid?
- e) What is meant by denaturation of proteins?
- f) What is a prodrug?
- g) Explain the term “therapeutic index”.
- h) Give the synthesis of sulphapyridine.
- i) Explain the term “drug affinity”.
- j) What is meant by isoelectric point?
- q) Explain the Zwitter ion structure of ^L amino acids.
- r) What happens when glycine is treated with lithium aluminium hydride?

PART-B
UNIT-I

Answer any **TWO** of the following.

2x10=20

2.
 - a) What are purines? Give the synthesis of uracil. 03
 - b) Give the synthesis of nicotine. 03
 - c) Discuss the structure of citral and give its synthesis. 04
3.
 - a) What are terpenes? How are they classified? 03
 - b) Give the synthesis of caffeine. 03
 - c) Outline the structure of coniine and give its synthesis. 04
4.
 - a) Write a note on exhaustive methylation of alkaloids. 03
 - b) Discuss the isolation of terpenoids from plant sources. 03
 - c) How are uric acid and adenine synthesized? 04

UNIT-II

Answer any **TWO** of the following.

2x10=20

- | | | | |
|----|----|---|----|
| 5. | a) | Discuss the steps involved in drug design. | 03 |
| | b) | Write a short note on Biosensors. | 03 |
| | c) | Give a brief explanation of different pharmacokinetic steps. | 04 |
| 6. | a) | Give the synthesis of sulphapyridine. | 03 |
| | b) | What is Phase I and Phase II metabolism? | 03 |
| | c) | With suitable examples, distinguish between analogs and prodrugs. | 04 |
| 7. | a) | Write a note on g-protein coupled receptor. | 03 |
| | b) | Explain enzyme inhibition. | 03 |
| | c) | Give the synthesis of
(i) chloramine-T (ii) paracetamol. | 04 |

UNIT-III

Answer any **TWO** of the following.

2x10=20

- | | | | |
|-----|----|---|----|
| 8. | a) | Give Gabriel phthalimide synthesis of ^L amino acids? | 03 |
| | g) | Explain the classification of proteins based on the morphology. | 03 |
| | h) | What are metalloporphyrins? Explain the structure of haemoglobin. | 04 |
| 9. | a) | Give the synthesis of vitamin A. | |
| | b) | Explain the classification of amino acids based on their structure. | 03 |
| | c) | Describe solid-phase peptide synthesis. | 04 |
| 10. | a) | Explain the synthesis of vitamin C. | |
| | b) | Discuss the role of potassium and selenium in biological systems. | 03 |
| | c) | How is peptide structure determined by end group analysis? | 04 |

CHE 602.2

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CREDIT BASED SIXTH SEMESTER B.Sc. DEGREE EXAMINATION APRIL 2015

CHEMISTRY

ELECTIVE II: BIOLOGICAL CHEMISTRY

Duration: 3 hours

Max marks: 80

PART A

1. Answer any **TEN** of the following: **2x10=20**

- a) Define Isoprene Rule.
- b) Give the structure of barbituric acid.
- c) How is purine synthesized?
- d) How are alkaloids classified based on heterocyclic nitrogen ring?
- e) Define the term potency.
- f) What is phase-I metabolism?
- g) What is a semisynthetic drug? Give an example.
- h) Give the synthesis of antipyrine.
- i) Mention the diseases caused by deficiency of vitamin A and K.
- j) What is isoelectric point?
- s) What is renaturation of proteins?
- t) Explain the role of selenium and cobalt in biological systems.

PART-B
UNIT-I

Answer any **TWO** of the following. **2x10=20**

2. a) Write the chemical synthesis of
(i) Citral (ii) Guanine 4+2
b) Explain the exhaustive methylation method of determination of alkaloid structure. 04
3. a) How is the structure of coniine established? Give its synthesis. 07
b) Explain the synthesis of uric acid. 03
4. a) Elucidate the structure of nicotine and give its physiological action. 07
b) Explain any one method of isolation of terpenes. 03

UNIT-II

Answer any **TWO** of the following. **2x10=20**

5. a) What are drugs? Explain the steps involved in drug design. 06
b) Give the synthesis of (i) Sulphanilamide (ii) Paracetamol 04
6. a) Give the application of biosensors in the medical, environmental and food industry. 05
b) What are the factors affecting drug metabolism? 05
7. a) Write a note on (i) Therapeutic index (ii) Enzyme inhibition 3+3
b) What are antimalarials? Write the structure of chloroquin. 02

- c) Give the synthesis of chloramine-T 02

UNIT-III

Answer any TWO of the following. 10x2=20

8. a) Give the chemical synthesis of Vitamin-C. 04
i) Write the structure and functions of haemoglobin. 04
j) Explain with example Gabriel's phthalimide synthesis. 02
9. a) Explain the different levels of protein structure.
b) Explain the terms 'peptide linkage' and electrophoresis. 04
10. a) How is the structure of peptides determined by end group analysis?
b) Explain the solution phase peptide synthesis. 04
c) Explain the term Zwitterion. 02

CREDIT BASED SIXTH SEMESTER B.Sc. DEGREE EXAMINATION APRIL 2016

CHEMISTRY**PAPER : Elective-2: BIOLOGICAL CHEMISTRY**

Duration: 3 hours

Max Marks: 80

PART A1. Answer any **TEN** of the following: 10x2=20

- a) How is the $-NCH_3$ group estimated in alkaloids?
- b) Give an example each for cyclic and acyclic ureides.
- c) How do you convert glycine into methyl amine?
- d) Write the structure of (i) Adenine (ii) Caffeine
- e) Give the synthesis of barbituric acid.
- f) Give an example for analgesic. Write its structure.
- g) What are agonists and antagonists?
- h) Explain the term "drug efficacy".
- i) What is meant by "Potency"?
- j) Explain renaturation of proteins.
- k) Amino acids are amphoteric – Explain.
- l) What is a conjugated protein. Give an example.

**PART-B
UNIT-I**Answer any **TWO** of the following. 2x10=20

2.
 - a) What are terpenes? How are they isolated? 03
 - b) Give the synthesis of guanine. 03
 - c) With suitable examples, explain the classification of alkaloids. 04
3.
 - a) How is uric acid synthesized? 03
 - b) Explain any three general characteristics of alkaloids. 03
 - c) Outline the structure of menthol and give its synthesis. 04
4.
 - a) What are alkaloids? How are they extracted? 03
 - b) Give the synthesis of uracil and mention its use. 03
 - c) Give the synthesis of Nicotine. 04

UNIT-IIAnswer any **TWO** of the following. 2x10=20

5.
 - a) What are antiseptics and disinfectants? Give examples. 03
 - b) Give synthesis of any two sulpha drugs. 03
 - c) With suitable examples, explain structure-activity relationships. 04

6. a) Write a note on ligand gated ion channel receptors. 03
b) Write a note on Biosensors. 03
c) How are drugs classified according to pharmacological action? Explain any four types with examples. 04
7. a) Explain the different steps involved in drug design? 03
b) Write a brief note on enzymes as drugs. 03
c) Discuss the classification of drugs based on chemical structure. 04

UNIT-III

Answer any TWO of the following.

2x10=20

8. a) How are proteins classified based on their composition. 03
b) Give the synthesis of vitamin C. 03
c) Discuss the structure and functions of chlorophyll. 04
9. a) How is vitamin A synthesized? 03
b) Discuss the role of sodium and zinc in the biological processes. 03
c) Write a note on the levels of protein structure. 04
10. a) Explain the Strecker synthesis of α – amino acids. 03
b) Explain denaturation of proteins. 03
c) How is the structure of a polypeptide determined by end-group analysis. 04
