

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2012

(CCSS)

Chemistry—Complementary Course

CH 3C 05—ORGANIC AND BIOCHEMISTRY

(2009 Admissions)

Time : Three Hours

Maximum : 30 Weightage

I. Multiple choice and fill in the blanks type questions. Answer all twelve questions.

1 Hybridisation of carbon in carbocation :

(a) sp .(b) sp^2 .(c) sp^3 .(d) sp^3d^2 .

2 According to Hückel's rule, furan is a :

(a) 6π system.(b) 4π system.(c) 2π system.(d) 14π system.

3 The attacking species in the nitration of benzene is :

(a) NO^+ .(b) NO_2^- .(c) NO_2^+ .(d) NO^- .

4 Walden inversion is observed in :

(a) SN^1 mechanism.(b) E_1 mechanism.(c) E_2 mechanism.(d) SN^2 mechanism.

5 Nuclear spin quantum number of proton :

(a) $\frac{1}{2}$

(b) 0

(c) 1.

(d) 2.

6 The most stable conformation of cyclohexane is :

(a) Chair form.

(b) Boat form.

(c) Half chair form.

(d) None of the above.

Turn over

7 Glycine is a

- (a) α -amino acid. (b) β -amino acid.
(c) γ -amino acid. (d) δ -amino acid.

8 Give an example of a basic amino acid.

9 Bakelite is a _____ plastic. (thermoplastic / thermosetting plastic).

10 The general molecular formula of **monoterpene** is _____

11 The molecular formula of nicotine is _____

12 _____ is an adrenal cortex hormone.

(12 x 3 = 36 weightage)

II. Short answer type questions. Answer all *nine* questions.

13 Differentiate between singlet and triplet **carbenes**.

14 Sketch the proton **NMR** spectrum of ethyl alcohol. Label the peaks.

15 Explain the mechanism of **dehydro** halogenation of **1-bromo** propane.

16 How will you distinguish between **maleic** and **fumaric** acid by the method of **cyclisation** ?

17 What are the important differences (structural and functional) between DNA and RNA ?

18 Define Thermoplastics. Give examples and explain their applications.

19 What are artificial hormones ?

20 Comment on the important physiological actions of alkaloids.

21 What is isoprene rule ?

(9 x 1 = 9 weightage)

III. Short essay or paragraph questions. Answer any *five* questions.

22 How can you differentiate between ethylene and **β -carotene** by UV-visible spectroscopy ?

23 Discuss the **aromaticity** of **pyrrole**. Comment on its basic character.

24 What are the different types of polymers ? Mention their important features.

25 Draw the conformations of **cyclo-hexane**. Comment on their stabilities.

26 What is meant by resolution ? Illustrate with examples.

27 Discuss the structure and stability of **carbanions**. What are the important reactions of **carbanions** ?

28 Write a brief note on **asymmetric** synthesis.

(5 x 2 = 10 weightage)

IV. Essay questions. Answer any *two* questions.

29 Explain the mechanism and stereo-chemistry of **nucleophilic** substitution on alkyl halides.

30 Discuss the primary, secondary and tertiary structure of proteins.

31 Discuss the mechanism of aromatic **electrophilic** substitution with special reference to nitration, **bromination** and Friedel-Crafts **alkylation**.

(2 x 4 = 8 **weightage**)