

UG Odd Semester (CBCS) Exam., December—2016

B.Sc (Honours) B.Ed

(5th Semester)

Course No. : BSED-501

Full Marks : 50
Pass Marks : 20

Time : 2 hours

The figures in the margin indicate full marks
for the questions

Candidates are to answer either BSCH-501
or BSZH-501

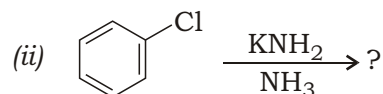
CHEMISTRY

(Honours)

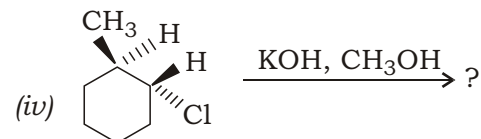
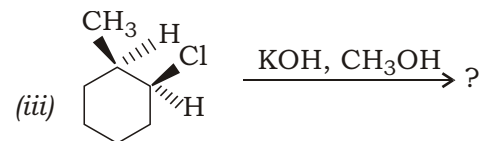
Course No. : BSCH-501

(Organic Chemistry)

1. (a) Complete the following reactions : 1×6=6



(2)



(b) Write the mechanisms of the following :

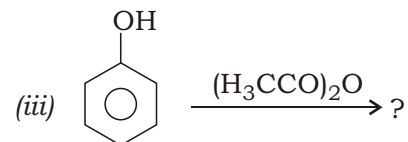
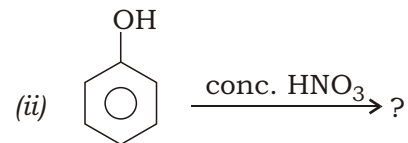
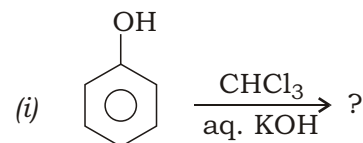
2×2=4

(i) E1 reaction

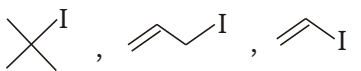
(ii) E2 reaction

OR

2. (a) Complete the following reactions : 1×3=3

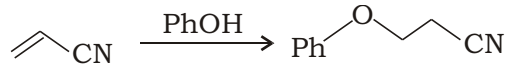


(3)

- (b) Between *para*-nitrophenol and phenol, which one is more acidic and why? 2
- (c) Write short notes on the following : $2\frac{1}{2} \times 2 = 5$
- (i) Claisen rearrangement
 - (ii) Huben-Hoesch reaction
3. (a) Write the energy profile diagram for an S_N1 reaction. 3
- (b) Write the reactivity order of the following alkyl halides towards S_N1 reaction : 2
- 
- (c) How may the S_N1 and S_N2 reactions be influenced by the addition of silver nitrate ($AgNO_3$)? 2
- (d) Predict the stereochemistry of the following reaction : 3
- $$\begin{array}{c} \text{Cl} \\ | \\ \text{H}_3\text{C}-\text{CH}-\text{CH}_2-\text{CH}_3 + \text{CH}_3\text{OH} \longrightarrow ? \\ \text{2-chlorobutane} \\ \text{(R-enantiomer)} \end{array}$$

(4)

OR

4. (a) Write a short note on Michael addition reaction. 4
- (b) Explain the term 'neighbouring group participation' with example. 3
- (c) Write the mechanism of the following nucleophilic addition reaction : 3
- 
5. (a) Define zwitter ion with example. 2
- (b) Write mechanism of synthesis of amino acid from phthalimide. 3
- (c) How will you titrate the carboxyl group ($-\text{COOH}$) present in the amino acid with a base? 2
- (d) Which amino acid cannot produce nitrogen on reaction with nitrous acid? 1
- (e) Write the name and structure of a peptide starting from a suitable amino acid. 2

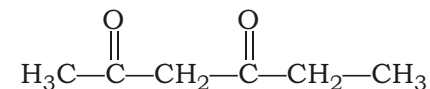
(5)

OR

6. (a) Write the mechanism of nitration of benzene. 3
- (b) What are the effects of the following groups on the basicity of aniline when in para position? 4
- (i) NO₂
- (ii) OR
- (iii) CO₂R
- (iv) NR₂
- (c) The *para*-toluidine reacts with benzenediazonium chloride to form a compound which, on boiling with H₂SO₄, gives four products (excluding nitrogen). Discuss. 3
7. (a) Explain keto-enol tautomerism with example. 2
- (b) Why is the methylene group present in diethyl malonate active? 2
- (c) Prepare
- $$\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$$
- from ethylacetoacetate (EAA). 3

(6)

(d) Prepare



from diethyl malonate (DEM). 3

OR

8. (a) Write the reaction mechanism of Knoevenagel reaction. 3
- (b) Explain the separation of a mixture of amines by Hofmann's method. 3
- (c) Prepare cyclopentane from suitable active methylene compound. 4
9. Write short notes on the following reactions : 2½×4=10
- (a) Birch reduction
- (b) Aldol condensation
- (c) Darzens reaction
- (d) Perkin reaction

OR

10. Write short notes on the use of the following reagents in reaction mechanism : 2½×4=10
- (a) Tributyl tin hydride
- (b) OsO₄
- (c) HIO₄
- (d) SO₂Cl₂

(7)

ZOOLOGY

(Honours)

Course No. : BSZH-501

(Cell Biology, Genetics and Applied Biology)

1. (a) Describe the ultra-structure of mitochondria. 7
- (b) Briefly explain the major functions of mitochondria. 3

OR

2. (a) Explain any two cell theories. 7
- (b) Give an elementary idea of cancer. 3
3. (a) Write notes on any *two* of the following : $2\frac{1}{2} \times 2 = 5$
- (i) Supplementary genes
- (ii) Duplicate genes
- (iii) Inhibitory genes
- (b) Explain Mendel's law of independent assortment with a suitable example. Comment on its limitations. 3+2=5

J7/629

(Turn Over)

(8)

OR

4. (a) What is meant by sex-linked inheritance? 2
- (b) Exemplify inheritance of X-linked genes in man (at least two). 4+4=8
5. (a) Describe any one type of animal distribution. 5
- (b) Enlist the factors that affect distribution. 5

OR

6. (a) Briefly outline different zoogeographical realms of the world. 6
- (b) What is the role of fauna in zoogeography? 4
7. (a) Describe the ways of collection of taxonomic species. 5
- (b) Give a detailed description of insect net. 5

OR

8. (a) Write a note on preservation of specimen. 5
- (b) What are the functions of a curator? 5

J7/629

(Continued)

(9)

9. (a) Explain the concept of space biology or exobiology. 5
- (b) Mention the effects of reduced atmospheric pressure. 5

OR

10. (a) Write a note on radiation in space. 5
- (b) Mention the effects of UV-radiations on living organisms. 5
