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R—38—2017

FACULTY OF SCIENCE

B.Sc. (Second Year) (Fourth Semester) EXAMINATION

MARCH/APRIL, 2017

CHEMISTRY

Paper VIII

(Organic and Inorganic Chemistry)

(MCQ & Theory)

(Saturday, 25-3-2017)

Time : 2.00 p.m. to 4.00 p.m.

Time—2 Hours

Maximum Marks—40

N.B. :— (i) Attempt All questions.

(ii) All questions carry equal marks.

(iii) Use separate answer-sheet (OMR sheet) for MCQ No. 1.

(iv) Use black ball point pen to darken the circle of correct choice in OMR sheet.

(v) Use only one answer-book for Sections A and B.

MCQ

1. Select the *correct* answer for each of the following multiple choice questions :

(i) Which of the following compounds shows geometrical isomerism ?

(a) $\text{H}_2\text{C} = \text{CH}_2$ (b) $\text{ClCH} = \text{CHBr}$

(c) $\text{H}_2\text{C} = \text{CHCl}$ (d) $\text{Cl}_2\text{C} = \text{CBr}_2$

(ii) Which of the following statements is *not* correct about glucose ?

(a) It is a monosaccharide.

(b) Its molecular formula is $\text{C}_6\text{H}_{12}\text{O}_6$.

(c) It contains an aldehyde group.

(d) It contains a ketonic group.

(iii) Molecular formula of Urea is :

(a) $\text{CO}_2\text{N}_2\text{H}_4$ (b) CON_2H_4

(c) CON_2H_2 (d) CONH_4

P.T.O.

- (iv) Optically active isomers that are not mirror images are called :
- (a) Enantiomers (b) Metamers
(c) Meso compounds (d) Diastereoisomers
- (v) Mild oxidation of D-glucose with bromine water gives :
- (a) D-gluconic acid (b) D-glucaric acid
(c) D-glucitol (d) All of these
- (vi) Diazomethane reacts with cyclopentanone to form :
- (a) Cyclobutanone (b) Cyclopropanone
(c) Cyclohexanone (d) Cyclohexane
- (vii) Oxidation of acetaldehyde by using selenium dioxide gives :
- (a) Glyoxal (b) Methyl glyoxal
(c) Ethyl glyoxal (d) Diethyl meso-oxalate
- (viii) Outermost electronic configuration of Gold is :
- (a) $3d^{10}4s^1$ (b) $4d^{10}5s^1$
(c) $5d^{10}6s^1$ (d) None of these
- (ix) Common oxidation state of Lanthanide series element is :
- (a) +2 (b) +3
(c) +4 (d) +5
- (x) The formula of Pitchblend is :
- (a) $\text{Na}_2\text{U}_3\text{O}_7$ (b) $\text{K}(\text{UO}_2)\text{VO}_4$
(c) $\text{K}(\text{UO}_2)\text{PO}_4$ (d) U_3O_8

Theory

Section A

(Organic Chemistry)

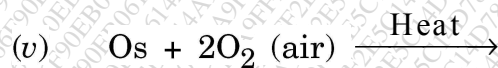
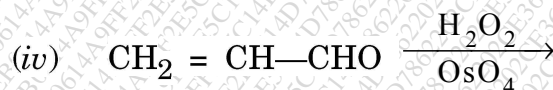
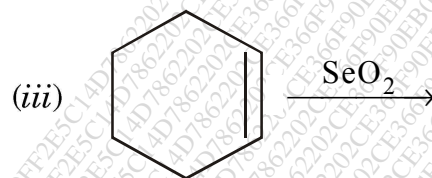
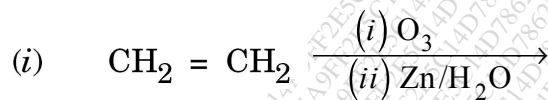
2. Solve any *two* of the following :

- (a) What is stereoisomerism ? Write R and S forms of :
- (i) Lactic acid
(ii) Glyceraldehyde.

- (b) What are Carbohydrates ? How are they classified ?
 (c) What are aromatic amines ? What is the action of the following on aniline ?

- (i) CS_2
 (ii) $\text{C}_6\text{H}_5\text{COCl}$
 (iii) $\text{C}_6\text{H}_5\text{CHO}$
 (iv) CHCl_3 and alc. KOH .

- (d) Predict the products :



3. Solve any *two* of the following :

- (a) Explain types of structural isomerism with suitable example.
 (b) What happens when glucose is reacted with :
 (i) Conc. HNO_3
 (ii) NaBH_4
 (iii) HI and red P
 (iv) HCN
 (v) One molecule of Phenylhydrazine.

P.T.O.

- (c) What are aromatic nitro compounds ? How will you prepare nitrobenzene from benzene ? Give any *three* physical properties of nitrobenzene.
- (d) (i) Explain Walden inversion with suitable example.
- (ii) Give preparation of borontrifluoride from boron. Give any *two* applications of borontrifluoride in organic synthesis.

Section B

(Inorganic Chemistry)

4. Answer any *two* of the following :
- (a) Compare the magnetic properties and geometry of complexes of second and third transition series elements with first transition series elements.
- (b) Write the compounds and complexes of Rhodium with variable oxidation state.
- (c) Explain the separation of lanthanide series elements by ion exchange method.
- (d) Give the outermost electronic configuration of actinide series elements.