This question paper contains **5** printed pages]

V—38—2017

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2017

CHEMISTRY

Paper VIII

(Organic and Inorganic Chemistry)

(MCQ + Theory)

(Sunday, 12-11-2017) **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 ballpoint 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 :

(1) CH_3OCH_3 and CH_3CH_2OH are ..... .

(A) Chain isomers

(B) Functional isomers

(C) Position isomers

(D) Metamers

P.T.O.

(2) A molecule is said to be chiral if it does not contain ..... .

(A) Plane of symmetry (B) Centre of symmetry

(C) Axis of symmetry (D) All of these

(3) Glucose when reduced with sodium borohydride or sodium amalgam and water gives ..... .

(A) Sorbitol (B) *n*-hexane

(C) Sodium gluconate (D) Glyceraldehyde

(4) Starch, cellulose are ..... .

(A) Monosaccharides (B) Disaccharides

(C) Trisaccharides (D) Polysaccharides

(5) Strucrture of urea is ..... .

(A) NH_2CONH_2 (B) CH_3CONH_2

(C) $NH_2 - NH_2$ (D) $C_6H_5NH.COCH_3$

(6) Urea reacts with hydrazine to give ..... .

(A) N-acetyl urea (B) Semicarbazide

(C) Cyanamide (D) Biuret

(7) Boron trifluoride can be used in the formation of ..... .

(A) Acids (B) Esters

(C) Diketones (D) All of these

(8) The General Electronic configuration of transition elements is ..... .

(A) $(n-1)d^{1-5}$ (B) $(n-1)d^{1-10}ns^1$

(C) $(n-1)d^{1-10}ns^{1-2}$ (D) $(n-1)d^{10}ns^2$

(9) Which of the following Tripositive Lanthanide ion has zero magnetic moment ..... .

(A) La^{+3} (B) Lu^{+3}

(C) Ce^{+3} (D) Only (A) and (B)

(10) Which of the following is *incorrect* statement ?

(A) Binding energies of 4*f* are higher than 5*f*.

(B) Lanthanides form oxocations whereas actinides do not form oxocations.

(C) All Actinides are Radioactive.

(D) '4*f*' electrons have greater shielding effect than 5*f* electrons.

Theory

Section A

(Organic Chemistry)

2. Solve any *two* of the following :

(*a*) What is cis-trans isomerism ? Give E and Z forms of :

(*i*) 2-pentene

(*ii*) Benzaldoxime.

(*b*) What are Carbohydrates ? How are they classified ?

(*c*) How will you prepare aniline from :

(*i*) Phenol;

(*ii*) Nitrobenzene ?

What is the action of the following on urea :

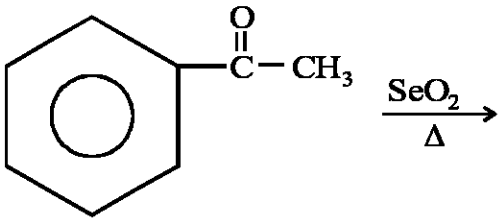
(*i*) Heat

(*ii*) HNO_3

(*iii*) $NH_2 - NH_2$?

P.T.O.

(*d*) Predict the products :

(*i*) 

(*ii*) $CH_2 = CH - CHO \xrightarrow{OsO_4}$

(*iii*) $2B + 2F_3 \xrightarrow{\text{Ignition}}$

(*iv*) $H_2C(COOC_2H_5)_2 \xrightarrow[\Delta]{SeO_2}$

(*v*) $Os + 2O_{2\,(air)} \xrightarrow{\text{Heat}}$

3. Solve any *two* of the following :

(*a*) Write short notes on :

(*i*) Relative configuration

(*ii*) Enantiomers.

(*b*) Define the following terms :

(*i*) Epimerisation

(*ii*) Mutarotation

(*iii*) Anomers

(*iv*) Oligosaccharides

(*v*) Optically active substance.

(*c*) What is the action of following on nitrobenzene ?

(*i*) HNO_3 / H_2SO_4

(*ii*) $Cl_2 / FeCl_3$

(*iii*) CH_3ONa / CH_3OH

(*iv*) $Zn / NaOH$

(*v*) Sn/HCl and NaOH.

(*d*) Give the preparation method of ozone. How is ozone used in the synthesis of :

(*i*) aldehyde;

(*ii*) hydroxy aldehyde ?

Section B

(Inorganic Chemistry)

4. Solve any *two* of the following :

(*a*) Give the comparison of IInd and IIIrd transition series elements with first transition series elements.

(*b*) Write in brief compounds formed by Palladium and Platinum.

(*c*) Explain magnetic properties of Lanthanides.

(*d*) Give electronic configuration of Actinides.