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BF—39—2016

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2016

CHEMISTRY

Paper VIII

(Organic and Inorganic Chemistry)

(MCQ + Theory)

(Thursday, 13-10-2016) **Time : 2.00 p.m. to 4.00 p.m.**

Time—2 *Hours* *Maximum Marks*—10+30=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 :

(1) Optically active isomers which are mirror images of each other are called as ..... .

(*a*) Enantiomers (*b*) Diastereoisomers

(*c*) Tautomers (*d*) Metamers

(2) Which of the following conversions is an example of Ruff degradation ?

(*a*) Glucose to Arabinose (*b*) Arabinose to Glucose

(*c*) Glucose to Fructose (*d*) Fructose to Glucose

(3) Lactic acid shows :

(*a*) Geometrical isomerism (*b*) Tautomerism

(*c*) Optical isomerism (*d*) None of these

P.T.O.

(4) Ammonium cyanate on heating undergoes rearrangement to form ..... .

(*a*) H_2NCONH_2 (*b*) $H_2N{\cdot}NH_2$

(*c*) NH_3 and CO_2 (*d*) $CH_3—NH_2$

(5) Glucose contains ..... .

(*a*) a ketonic group

(*b*) an aldehyde group

(*c*) a carboxylic acid group

(*d*) a cyanide group

(6) Which of the following substituents lowers the basicity of aniline ?

(*a*) $—CH_3$ (*b*) $—OCH_3$

(*c*) $—NH_2$ (*d*) $—NO_2$

(7) $ROH + CO + BF_3 \xrightarrow[500\ atm]{125° - 180°C} A$; where A is :

(*a*) ROR (*b*) RCOR

(*c*) RCOOR (*d*) RCOOH

(8) Outermost electronic configuration of silver is ..... .

(*a*) $3d^{10}\ 4s^1$ (*b*) $5d^{10}\ 6s^1$

(*c*) $4d^{10}\ 5s^1$ (*d*) $3d^5\ 4s^1$

(9) In periodic table Lanthanide series elements are placed in ..... .

(*a*) 3rd group and 6th period

(*b*) 3rd group and 3rd period

(*c*) 3rd group and 2nd period

(*d*) 3rd group and 5th period

(10) Actinide series elements have progressively filled ..... subshell.

(*a*) 4*f* (*b*) 5*f*

(*c*) 6*f* (*d*) None of these

Theory

Section A

(Organic Chemistry)

2. Solve any *two* of the following :

(*a*) Define the following terms :

(*i*) Asymmetric carbon atom

(*ii*) Optically active substance

(*iii*) Racemic mixture

(*iv*) Plane of symmetry

(*v*) Chain isomers.

(*b*) How is glucose converted into fructose ?

(*c*) (1) How will you prepare aniline from :

(*i*) Chlorobenzene

(*ii*) Nitrobenzene

(*iii*) Phenol ?

(2) What is the action of the following on diazomethane ?

(*i*) Heat

(*ii*) Phenol.

(*d*) How will you prepare selenium dioxide from metallic selenium ? What is the action of SeO_2 on :

(*i*) CH_3CHO

(*ii*) CH_3COCH_3

(*iii*) $C_6H_5CH_2OH$

(*iv*) CH_3COOH ?

3. Solve any *two* of the following :

(*a*) What is structural isomerism ? Give cis and trans forms of :

(*i*) 2-butene

(*ii*) 1, 2-dibromoethene ?

(*b*) Explain Osazone formation of glucose with its mechanism.

(*c*) How will you convert benzene into nitrobenzene ? Explain the following reactions of nitrobenzene :

(*i*) Reduction in acidic medium

(*ii*) Reduction in neutral medium

(*iii*) Electrolytic reduction.

(*d*) (*i*) What are monosaccharides ? Give their classification with suitable example.

(*ii*) How will you prepare osmium tetraoxide from osmium metal ? How will you bring about conversion of acraldehyde into glyceraldehyde using OsO_4 ?

Section B

(Inorganic Chemistry)

4. Answer any *two* of the following :

(*a*) Give the general characteristics of *d* block elements.

(*b*) Compare the atomic or ionic radii properties of second and third transition series elements with first transition series elements.

(*c*) Give any *five* applications of lanthanides.

(*d*) Calculate the magnetic moment of Ce^{+3}.