This question paper contains **4** printed pages]

W—41—2018

FACULTY OF SCIENCE
B.Sc. (Second Year) (Fourth Semester) EXAMINATION
OCTOBER/NOVEMBER, 2018
(CBCS/CGPA Pattern)
CHEMISTRY
Paper VIII (CCC IV)
(Organic and Inorganic Chemistry)
(MCQ+Theory)

(Thursday, 11-10-2018)   **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 Q. No. **1**.

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

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

(MCQ)

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

    (*i*)   The separation of Racemic mixture into its two optically active compounds is known as ....
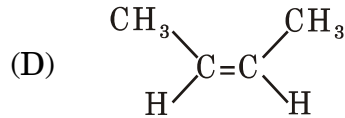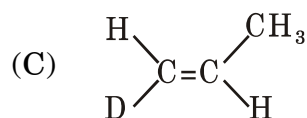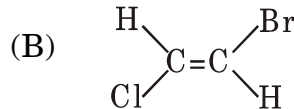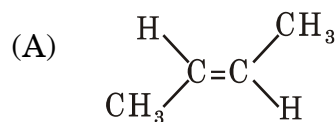
       (A)   Racemisation   (B)   Resolution

       (C)   Crystallisation   (D)   Enantiomerism

    (*ii*)   Which of the following compounds is Z form of geometrical isomer ?

P.T.O.

(*iii*)　Fructose is ....

(A)　Ketose　　　　　　　　(B)　Aldose

(C)　Glycose　　　　　　　　(D)　All of these

(*iv*)　Anomers of glucose (α form and β form) differ in the stereochemistry at ....

(A)　C—1　　　　　　　　(B)　C—2

(C)　C—3　　　　　　　　(D)　C—4

(*v*)　Aniline + Aldehyde $\xrightarrow{\text{Warm}}$ A + H_2O; where A is ....

(A)　carbyl amine　　　　　　(B)　acetanilide

(C)　schiff base　　　　　　　(D)　benzoyl chloride

(*vi*)　Which of the following compounds is least basic ?

(A)　*p*-methoxy aniline　　　(B)　*p*-nitro aniline

(C)　Aniline　　　　　　　　(D)　*p*-methyl aniline

(*vii*)　A + $2O_2$ (air) $\xrightarrow{\text{Strong heat}}$ OsO_4; where A is :

(A)　Se　　　　　　　　　　(B)　Pb

(C)　Os　　　　　　　　　　(D)　Fe

(*viii*)　Which of the following trivalent Lanthanide ion is diamagnetic ?

(A)　Tm^{+3}　　　　　　　(B)　Pr^{+3}

(C)　Lu^{+3}　　　　　　　(D)　Nd^{+3}

(*ix*)　Which of the following ions is colourless in its aqueous solution ?

(A)　Th^{+4}　　　　　　　(B)　Np^{+3}

(C)　Am^{+3}　　　　　　　(D)　Cm^{+3}

(*x*)　Which of the following do *not* belong to the same group ?

(A)　Cr, Mo, W　　　　　　(B)　Ni, Pd, Pt

(C)　Cu, Ag, Au　　　　　　(D)　Mn, Ru, Re
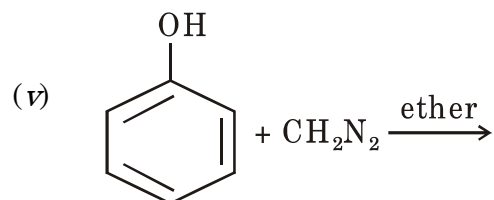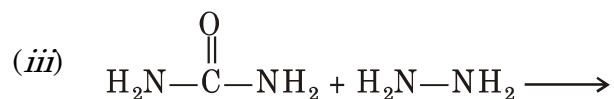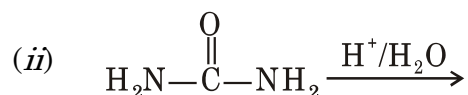
(Theory)

Section A

(Organic Chemistry)

2.   Solve any *two* of the following :

 (*a*)   Discuss enantiomers and diastereoisomers with suitable example.

 (*b*)   Give reduction reactions of nitrobenzene under alkaline medium in detail.

 (*c*)   Explain osazone formation of glucose with mechanism.

 (*d*)   Give *two* methods for the synthesis of BF_3. What happens when :

  (*i*) OsO_4 reacts with alkene

  (*ii*) SeO_2 reacts with cyclohexanone

  (*iii*) CH_3OH reacts with CO in the presence of BF_3 ?

3.   Solve any *two* of the following :

 (*a*)   Explain with suitable example :

  (*i*)   Plane of symmetry and centre of symmetry.

  (*ii*)   Walden inversion.

 (*b*)   Predict the products :

  (*i*) $CO_2 + 2NH_3 \xrightarrow[\text{35 atm}]{\text{130-150°C}}$

  (*ii*) $H_2N-\overset{\overset{O}{\|}}{C}-NH_2 \xrightarrow{H^+/H_2O}$

  (*iii*) $H_2N-\overset{\overset{O}{\|}}{C}-NH_2 + H_2N-NH_2 \longrightarrow$

  (*iv*) $H_2N-\overset{\overset{O}{\|}}{C}-NH_2 + SOCl_2 \longrightarrow$

  (*v*) $+ CH_2N_2 \xrightarrow{\text{ether}}$

(*c*) How will you prepare Selenium dioxide ? Give its any *four* synthetic applications.

(*d*) Explain cyclic structure of glucose.

Section B

(Inorganic Chemistry)

4. Answer any *two* of the following :

(*a*) What is Lanthanide contraction ? Give its cause and consequences.

(*b*) Compare the properties of actinides with that of lanthanides.

(*c*) Write the electronic configuration of third transition series.

(*d*) (*i*) Give *three* ores of uranium with formulae.

(*ii*) Write a note on Fulmunating gold.