

This question paper contains 4 printed pages]

BF—37—2016

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2016

CHEMISTRY

Paper III

(Organic and Inorganic Chemistry)

(MCQ+Theory)

(Thursday, 13-10-2016)

Time : 10.00 a.m. to 12.00 noon

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 Question No. 1.

(MCQ)

1. Select the correct answer for each of the following Multiple Choice Questions :

(i) Carbon atom of benzene is hybridized.

(a) sp^3

(b) sp^2

(c) sp

(d) sp^3d

(ii) According to Huckel rule, aromatic compound contains π electrons.

(a) $4n + 1$

(b) $4n - 1$

(c) $4n + 2$

(d) $4n - 2$

(iii) is ortho-para directing group on benzene towards electrophilic substitution reaction.

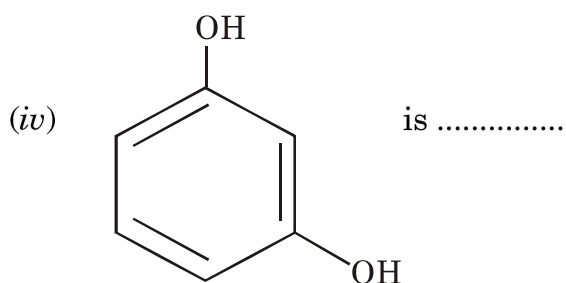
(a) $-\text{OH}$

(b) $-\text{CH}_3$

(c) $-\text{NO}_2$

(d) Both (a) and (b)

P.T.O.



- (a) Catechol (b) Resorcinol
(c) Quinol (d) Pyrogallol
- (v) Chlorobenzene is prepared from diazonium salt by reaction.
(a) Hunsdiecker (b) Gattermann
(c) Balz-Schiemann (d) Ullmann
- (vi) In Dow's process, chlorobenzene is converted into
(a) Benzene (b) Fluorobenzene
(c) Bromobenzene (d) Phenol
- (vii) The IUPAC name of CH_3CONH_2 is
(a) Ethanamide (b) Acetamide
(c) Propanamide (d) None of these
- (viii) Which of the following is strongest Lewis base ?
(a) CH_3^- (b) NH_2^-
(c) OH^- (d) F^-
- (ix) Which of the following can act as both Bronsted acid and Bronsted base ?
(a) Na_2CO_3 (b) HCO_3^-
(c) NH_3 (d) None of these
- (x) Oxidising action of halogens increases in the order
(a) $\text{Cl} < \text{Br} < \text{I} < \text{F}$ (b) $\text{Cl} < \text{I} < \text{Br} < \text{F}$
(c) $\text{I} < \text{Cl} < \text{F} < \text{Br}$ (d) $\text{I} < \text{Br} < \text{Cl} < \text{F}$

(Theory)**Section A****(Organic Chemistry)**

2. Answer any *two* of the following :
- (a) Explain Birch reduction of benzene with mechanism.
 - (b) Explain Friedel-Craft acylation reaction of phenol with mechanism.
 - (c) Explain Ullmann biphenyl synthesis with mechanism.
 - (d) (i) How will you prepare ethyl acetate from :
 - (1) Ethyl alcohol and acetic acid
 - (2) Ethyl alcohol and acetyl chloride ?
 - (ii) What is the action of the following on ethyl acetate ?
 - (1) NaOH
 - (2) CH_3NH_2
 - (3) LiAlH_4 .
3. Answer any *two* of the following :
- (a) State Huckel rule. Explain aromaticity of the following compounds :
 - (i) Benzene
 - (ii) Naphthalene.
 - (b) Explain relative reactivity of Alkyl halide Vs. Vinyl and aryl halides towards nucleophilic substitution reaction.
 - (c) How will you convert :
 - (i) Acetyl chloride to acetic anhydride.
 - (ii) Acetic anhydride to ethyl acetate.
 - (iii) Acetamide to acetic acid.
 - (iv) Acetic anhydride to acetophenone.
 - (v) Acetic anhydride to N-methyl ethanamide.
 - (d) (i) Explain meta directing nature of $-\text{NO}_2$ group in nitrobenzene.
 - (ii) How will you synthesize salicylic acid from sodium phenoxide.

P.T.O.

Section B
(Inorganic Chemistry)

4. Answer any *two* of the following :
- (a) Explain the following properties of P-block elements :
 - (i) Metallic
 - (ii) Ionization energy.
 - (b) (i) Explain acidic and basic character of hydroxides of III A group elements.
 - (ii) Discuss the charge on species and electronegativity affecting relative strength of acids and bases.
 - (c) Define acids and bases according to Cady-Elsey concept and Usanovich concept with suitable example.
 - (d) Explain the following factors affecting on relative strength of acids and bases :
 - (i) Oxidation number of central atom.
 - (ii) Hydration and other energies.