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

V—36—2017

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2017

(CBCS/CGPA Pattern)

CHEMISTRY

Paper III

(Organic and Inorganic Chemistry)

(MCQ + Theory)

(Sunday, 12-11-2017)   **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 OMR sheet for question No. **1**.

  (iv)   Calculator is allowed.

  (v)   Only one answer sheet should be used for Sections A and B.

MCQ

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

  (1)   The carbon-carbon bond length in benzene is ....

  (A)   1.33 Å   (B)   1.40 Å

  (C)   1.54 Å   (D)   1.30 Å
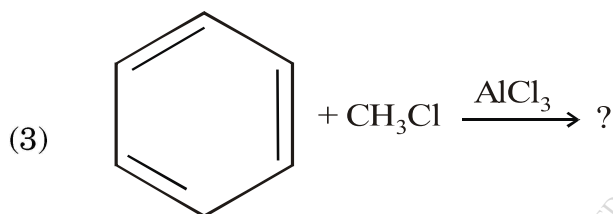
  (2)   Which of the following compounds is not Aromatic ?

  (A)   Pyridine   (B)   Anthracene

  (C)   Thiophene   (D)   Cyclopentene

P.T.O.

(3)

+ CH$_3$Cl $\xrightarrow{\text{AlCl}_3}$?

(A)   Toluene

(B)   Chlorobenzene

(C)   Both (A) and (B)

(D)   None of these

(4)   Pyrogallol is .... phenol.

(A)   Monohydric

(B)   Dihydric

(C)   Trihydric

(D)   None of these

(5)   The carbon atom in vinyl chloride is ....

(A) sp^2

(B) sp

(C) sp^3

(D) dsp^2

(6)   Ullman reaction is also called as .... reaction.

(A)   Substitution

(B)   Addition

(C)   Elimination

(D)   Coupling

(7)   The IUPAC name of
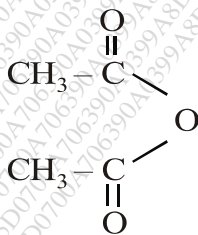
is ....

(A)   Acetic Anhydride

(B)   Methanoic Anhydride

(C)   Ethanoic Anhydride

(D)   Propanoic Anhydride

(8) Which of the following element shows highest melting point ....

(A) S (B) Se

(C) Te (D) Po

(9) The term hard and soft acid and base was given by ....

(A) Bronsted (B) Lewis

(C) Franklin (D) Pearson

(10) The Strongest Bronsted base in the following anion is ....

(A) ClO^- (B) ClO_2^-

(C) ClO_3^- (D) ClO_4^-

Theory

Section A

(Organic Chemistry)

2. Answer any *two* of the following :

(*a*) State Huckel Rule. Explain aromaticity of the following compounds :

(*i*) Anthracene

(*ii*) Furan

(*b*) Explain Reimer-Tiemann reaction of phenol with mechanism.

(*c*) (*i*) How will you synthesize vinyl chloride from :

(1) 1, 2-dichloroethane

(2) Ethyne

P.T.O.

(*ii*) How will you prepare ....

    (1) Chlorobenzene from benzene diazonium chloride

    (2) Bromobenzene from silver benzoate.

(*d*) Explain nitration of benzene with mechanism.

3. Answer any *two* of the following :

(*a*) Explain the o/p-directing nature of –OH group in phenol and *m*-directing nature of –NO_2 group in nitrobenzene.

(*b*) (*i*) Explain the Gatterman reaction of halobenzene.

    (*ii*) How will you synthesize allyl iodide from :

        (1) Allyl Chloride

        (2) Glycerol and HI

(*c*) (*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) $LiAlH_4$

(*d*) (*i*) Explain Fries rearrangement.

    (*ii*) How will you convert acetic anhydride into :

        (1) Acetic acid

        (2) Ethyl acetate.

Section B

(Inorganic Chemistry)

4. Answer any *two* of the following :

(*a*) Discuss the diagonal relationship between B and Si.

(*b*) (*i*) Explain the oxidising and reducing properties of 'VII A' group elements.

(*ii*) Discuss the solvent system concept of acids and bases with suitable example.

(*c*) State and explain HSAB principle. Discuss its following applications :

(*i*) Relative stability of compounds

(*ii*) Feasibility of chemical reaction.

(*d*) Define and explain the following concepts of acids and bases with example :

(*i*) Arrhenius concept

(*ii*) Lewis concept.