B.A. / B.Sc. SEMESTER 3 EXAMINATION, 2021
FAKIR CHAND COLLEGE CENTRE (551)

INSTRUCTIONS FOR CANDIDATES

READ ALL THE INSTRUCTIONS CAREFULLY BEFORE WRITING ANSWERS

1. Total **TIME OF EXAMINATION: 2 HOURS (30 Mins. For Each Paper)**
2. **A) Question Paper Comprises Of FOUR Separate Questions – CC5 (10 Marks), CC6 (10 Marks), CC7 (10 Marks) And SEC-A2 (10 Marks).**

   B) CANDIDATES MUST HAVE TO ANSWER CC5, CC6, CC7 AND SEC-A2 SEPARATELY IN FOUR SEPARATE PAGES [EACH IN A A4-SIZED PLAIN PAPER).

   C) ON EACH PAPER CLEARLY MENTION ROLL NO., UNIVERSITY REG. NO. AND PAPER NO. ON TOP OF THE PAGE AND THEN BELOW WRITE ONLY THE CHOSEN OPTIONS AGAINST CORRESPONDING QUESTION NUMBERS *(For Example, If Option 'A' Is Correct For Q.1 Then Write Q.1 – A)*].

   D) Then Candidates Have To Prepare FOUR SEPARATE PDF FILES By Scanning Each Of The Four Answer Scripts Clearly [Give File Names As'University Roll No.(Paper No.)' Format (Like 203551-XX-XXXX(CC11), 203551-XX-XXXX(CC12), 203551-XX-XXXX(DSE-A2) And 203551-XX-XXXX(DSE-B1)]

   E) Finally, Upload The Four Files One By One In The Stipulated Places Of The Google Form before Submission Of The Form.
3. Use **ONLY BLUE INK (Writings MUST be clearly visible)** For Writing Your Answers
4. Give **AT LEAST 1CM MARGINS** In All The Four Sides Of Each Page

2021
B.A. /B.Sc. Semester 3 Examination
University of Calcutta
CHEMISTRY – HONOURS
INTERNAL
Paper: CC5 **F.M. 10**

FAKIR CHAND COLLEGE CENTRE (551)

Choose The Correct Answer: **1x10=10**

1. Identify whether they are extensive or intensive: (i) Free energy (ii) molar enthalpy (iii) heat capacity

   a) (i, iii) intensive (ii) extensive b) (i, ii) intensive (iii) extensive c) (i, iii) extensive (ii) intensive

2. If 1 (Molal) aqueous solution of an alcohol has a vapour pressure of 17.222 mm of mercury at 20^0C and in that temperature vapour pressure of pure water is 17.535 mm. then activity of pure water in the given solution is
   a) 0.982 b) 0.892 c) 0.928

3. At inversion temperature, the value of Joule Thomson coefficient, μ_{JT} is
   a) > 0 b) = 0 c) < 0

4. At 298K pH of the 0.10 (M) Sodium Acetate is (Given, $K_w = 1\times10^{-14}$, K_a for Acetic acid = 1.8×10^{-5})
   a) 8.87 b) 8.78 c) 7.88

5. When a Glass electrode is immersed in an aqueous solution the developed potential is
   a) a nonlinear function of H^+ ion b) a linear function Na^+ ion c) a linear function of H^+ ion

6. Which one is the buffer solution?
   a) 10 ml 0.4N acetic acid + 10 ml 0.4N NaOH, b) 5 ml 0.4N acetic acid + 10 ml 0.4N NaOH, c) 10 ml 0.4N acetic acid + 5 ml 0.4N NaOH,

7. In pH metric titration curve of CH_3COOH against NaOH, buffering action will be maximum
   a) Near half equivalence point b) at equivalence point c) at ¼ neutralisation point

8. How many inflection points will be observed in conductometric metric titration curve when HCl and acetic acid mixture is titrated with NaOH solution?
   a) 1 b) 2 c) 3

9. J-T cooling occurs in case of
   a) Only ideal gases b) real gases with temp. > inversion temp. c) real gases with temp. < inversion temp.

10. When Benzoic acid is distributed between water and benzene having concentration C_1 & C_2 respectively, then the distribution coefficient, K_D will be
    a) $\sqrt{\frac{C_1}{C_2}}$ b) $\frac{C_1}{\sqrt{C_2}}$ c) $\frac{\sqrt{C_1}}{C_2}$

2021
B.A./B.Sc. Semester 3 Examination
University of Calcutta
CHEMISTRY – HONOURS
INTERNAL EXAMINATION
Paper : CC6
F.M. – 10

FAKIR CHAND COLLEGE CENTRE (C551)

Choose the correct option in each case and report (no need to write the answer in sentence):1x10

ANSWER ALL THE QUESTIONS

1. Silicones are
   a) organo-silicon polymers having R_2SiO group as the unit building block
   b) organo-silicate polymers having R_2SiO group as the unit building block
   c) organo-silicon polymers having R_3SiO group as the unit building block

2. Inorganic benzene is
   a) $(BN)_x$ b) BN c) $B_3N_3H_6$

3. The structure of XeF_4 is
   a) square pyramidal b) square planar c) trigonal bipyramidal

4. Neon is widely used
   a) in metallurgy b) in meteorological balloons c) in electronics

5. Which among the following is not a double salt?
   a) ferric alum b) potassium ferrocyanide c) mohr's salt

6. Which is not a characteristics of BeH_2 ?
   a) It is an amorphous white solid.
   b) It is a polymeric compound.
   c) It doesn't undergo rapid hydrolysis by acids.

7. Iodine is more soluble in water in the presence of iodide salt
   a) due to the formation of I_3^-
   b) due to the formation of IO_3^-
   c) due to ionic nature of iodide salt

8. Which among the following is an ambidentate ligand?
   a) hydroxide ion b) nitrite ion c) phosphate ion

9. According to the Mulliken scale
   a) electronegativities of elements are related to their bond energies.
   b) average of ionization potential and electron affinity is a measure of electronegativity.
   c) electronegativity is related to the electric field at the surface of an atom.

10. The relativistic effect contributes to
    a) lanthanide contraction b) increased reactivity c) decreased reactivity

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University of Calcutta
CHEMISTRY – HONOURS
INTERNAL EXAMINATION
Paper: CC7
F.M. – 10

FAKIR CHAND COLLEGE CENTRE (C551)

Choose the correct option in each case and report (no need to write the answer in sentence): **1x10**

ANSWER ALL THE QUESTIONS

1. Anti-markownikoff addition to alkene observed only for

   a) HCl b) HBr c) HI

2. Arrange the following compounds in order of increasing reactivity towards addition of bromine

   (i) $CH_3CH_2CH=CH_2$ (ii) $CH_2=CH_2$ (iii) $CH_2=CHCOOH$ (iv) $CH_3CH=CHC_2H_5$

   a) iii<ii<i<iv b) iii<i<ii<iv c) ii<iii<i<iv

3. Hydration of alkyne occurs when treated with dil. H_2SO_4 at 60-80°C in presence of catalyst

   a) $CuSO_4$ b) $AgSO_4$ c) $HgSO_4$

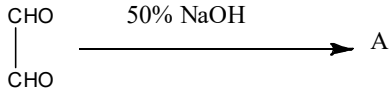
4. *cis*-hydroxylation of alkenes occurs with

   a) $KMnO_4$ b) OsO_4 c) both

5. Epoxidation of α, β –unsaturated carbonyl compounds require the reagent

   a) H_2O_2/NaOH b) Peracetic acid c) H_2O_2

6. Predict the product (A) of the following reaction.



Product A is

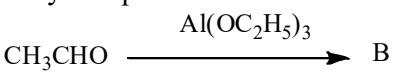
a) 

b) 

c) 

7. Compound does not undergo benzoin condensation a) *p*- nitro benzaldehyde b) benzaldehyde c) *o*-nitro benzaldehyde

8. Identify compound B



Product B is

a) Ethylacetate b) Methylacetate c) Propylformate

9. Acetone can be identified by a) Tollens' reagent b) Brady's reagent c) Fehling's reagent

10. 'Oil of Wintergreen' test is performed for identification of a) MeOH b) EtOH c) PhOH

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University of Calcutta
CHEMISTRY – HONOURS
INTERNAL EXAMINATION
Paper : SEC-A2
F.M. – 10

FAKIR CHAND COLLEGE CENTRE (C551)

Choose the correct option in each case and report (no need to write the answer in sentence): **1x10**

ANSWER ALL THE QUESTIONS

1. The tertiary structure of proteins is stabilized by
   a) hydrogen bonding b) disulphide bridge c) both (a) and (b)
2. Denaturation of protein means
   a) its quarternary and tertiary structures are broken down
   b) its quarternary, tertiary and secondary structures are broken down
   c) all the constituent amino acids are separated out
3. Isoelectric point of an amino acid is that where
   a) the amino acid has no net charge
   b) both the α-amino and carboxyl groups exist in non-ionic form
   c) none of the above
4. Myosin is
   a) a globular protein b) a fibrous protein c) an intermediate protein
5. The prosthetic groups of conjugate proteins may be
   a) metal ions b) phosphoric acids c) both (a) and (b)
6. The function of Actin is
   a) transportation of materials in cells b) force generators of muscles
   c) storage of metal ions and amino acids in cells
7. Sephadex can be used as a stationary phase in
   a) Gel filtration chromatography b) Affinity chromatography
   c) Ion-exchange chromatography
8. In SDS-PAGE of proteins, β-mercaptoethanol is used
   a) to disrupt disulphide bridges necessary for protein denaturation
   b) to disrupt hydrogen bonds
   c) to break electrostatic interactions
9. Protein motifs are the
   a) super secondary structures of proteins b) quarternary structures of proteins
   c) active sites of proteins
10. Tay-Sachs disease occurs from the
    a) disorder in protein metabolism b) disorder in ganglioside breakdown
    c) disorder in cerebroside breakdown