B.A. / B.Sc. SEMESTER 4 EXAMINATION, 2021
FAKIR CHAND COLLEGE CENTRE (551)

INSTRUCTIONS FOR CANDIDATES

READ ALL THE INSTRUCTIONS CAREFULLY BEFORE WRITING ANSWERS

1. Total **TIME OF EXAMINATION: 2 HOUR**
2. **Question Paper Comprises Of Four Separate Questions – CC8 (10 Marks), CC9 (10 Marks), CC10 (10 Marks) And SEC-B (10 Marks). Candidates Must Have To Answer All The Four Question papers Separately And Have To Prepare Four pdf Files.**
3. **In The Answer Script Only Question Number & Correct Option To Be Mentioned. No Need Of Writing The Whole Answer.**
4. **ANYONE PREVIOUS SEMESTER ADMIT CARD As The Last Page Of Each pdf File**
5. **University Roll Number must be there in each pdf file name**
6. Use Only **WHITE PLAIN A4 PAPERS** For Writing Answers
7. Use **ONLY BLACK INK** For Writing Your Answers
8. Give **A TOP PAGE** With Clear Mention Of University **REGISTRATION NO. AND UNIVERSITY ROLL NO.** Of Anyone Previous Semester
9. Give **AT LEAST 1CM MARGINS** In All The Four Sides Of Each Page

2021
B.A./B.Sc. Semester 4 Examination
University of Calcutta
CHEMISTRY – HONOURS
INTERNAL EXAMINATION
Paper : CC8
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**

1. The pH range of Brady's reagent is
   a) Alkaline b) Acidic c) Neutral
2. $RCONH_2$ reacts with $Br_2 / \overline{O}H$ to produce
   a) RNH_2 b) RCH_2NH_2 c) RCONHBr
3. The product of Arndt-Eistert synthesis with RCH_2COOH is
   a) RCOOH b) RCH_2CH_2COOH c) CH_3COOH
4. The illogical electrophile found by disconnection of $R_1COCH_2CH_2CH_2CH_2COR_2$ is
   a) $RCOCH_2CH_2\overline{C}H_2$ b) $RCOCH_2\overline{C}H_2$ c) Both (a) and (b)
5. R-N=C=O is the intermediate of
   a) Curtius rearrangement b) Schmidt rearrangement c) Both (a) and (b)
6. If we compare the O-H stretching frequency of 2-hydroxybenzoic acid and 4-hydroxybenzoic acid it is observed that
   a) the frequency is lower for 2-hydroxybenzoic acid
   b) the frequency is lower for 4-hydroxybenzoic acid
   c) the frequency is in the same range for both the compounds
7. The correct sequence of energy requirement for electronic excitation during UV spectroscopy is
   a) $\sigma \rightarrow \sigma^* > \pi \rightarrow \pi^* > n \rightarrow \pi^*$
   b) $\pi \rightarrow \pi^* > \sigma \rightarrow \sigma^* > n \rightarrow \pi^*$
   c) $\sigma \rightarrow \sigma^* > n \rightarrow \pi^* > \pi \rightarrow \pi^*$
8. During azo dye test of aromatic primary amine the pH range should be
   a) Basic b) Acidic c) does not depend on pH
9. The full name of 2,4-DNP.HCl is
   a) 2,4-Dinitrophenol hydrochloride b) 2,4-Dinitrophenylhydroxylamine hydrochloride
   c) 2,4-Dinitrophenylhydrazine hydrochloride
10. $C_6H_5NHCH_3$ in condition of diazotization produces
    a) diazonium salt b) Nitrosamine c) does not react

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F.M. – 10

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

I. Following are the examples of Colligative properties:
a) Elevation of boiling points *b) Depression of Freezing points* *c) Osmotic Pressure* *d) All of these*

II. For mixing of different ideal gases
a) $\Delta S_{Mix} = 0$ *b)* $\Delta H_{Mix} = 0$ *c) both are zero* *d) none of them is zero*

III. In a phase diagram of any system at Triple point, the value of degrees of Freedom is
a) 0 *b) 1* *c) –1* *d) undefined*

IV. The wave nature of electron is observed in the following experiment
a) Photo-electric effect *b) Compton effect* *c) Diffraction* *d) Black body radiation*

V. Quantum mechanical operator for momentum along x-axis is
a) $-i\hbar\frac{d}{dx}$ *b)* $i\hbar\frac{d}{dx}$ *c)* $\frac{\hbar}{i}\frac{d}{dx}$ *d) both a) and c)*

VI. The energy of the particle of mass, "m" in a one-dimensional box of length "L" at "n = 2" level is
a) $\frac{h^2}{8ma^2}$ *b)* $\frac{h^2}{2mL^2}$ *c)* $\frac{h^2}{4mL^2}$ *d)* $\frac{h^2}{8mL^2}$

VII. The maximum in the probability density plot of the particle of mass, "m" in a one-dimensional box of length "L" at ground state is found at
a) $\frac{1}{4}L$ *b)* $\frac{3}{4}L$ *c)* $\frac{1}{2}L$ *d)* $\frac{1}{3}L$

VIII. What is the Miller indices of the plane whose Weiss indices are represented as (2a : b : ∞ c)
a) 1: 2: 1 *b) 2: 1: ∞* *c) 2: 1: 0* *d) 1: 2: 0*

IX. For determination of lattice spacing in a crystalline solid which light is used as an irradiating source
a) Gama ray *b) X-ray* *c) IR ray* *d) UV ray*

X. Debye's T^3 law is valid at
a) moderate T *b) very high T* *c) very low T* *d) does not depend on T*

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FAKIR CHAND COLLEGE CENTRE (C551)

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

1. La^{3+} is

   a) diamagnetic b) paramagnetic c) antiferromagnetic

2. The most common oxidation state of Copper is

   a) +1 b) +2 c) +3

3. stepwise stability constants for Zn(II)-en complexes follow the order (en = ethylene diamine)

   a) $K_1 > K_2 >> K_3$ b) $K_1 > K_3 > K_2$ c) $K_3 >> K_1 > K_2$

4. In separation of lanthanides by ion -exchange method , the eluting agent acts as a

   a) dehydrating agent b) a buffering agent c) a complexing agent

5. The magnitude of Crystal field splitting in an octahedral field depends on

   a) nature of ligands b) nature of metal ions c) charge on ligands

6. Iodide (I^-) is

   a) an ambidentate ligand b) a strong field ligand c) a weak field ligand

7. 10 Dq increases in the order

   a) $[CrCl_6]^{3-} < [Cr(NH_3)_6]^{3+} < [Cr(CN)_6]^{3-}$

   b) $[Cr(CN)_6]^{3-} < [CrCl_6]^{3-} < [Cr(NH_3)_6]^{3+}$

   c) $[Cr(NH_3)_6]^{3+} < [Cr(CN)_6]^{3-} < [CrCl_6]^{3-}$

8. Ni(II), Cu(II), Pd(II), Pt(II) commonly form

   a) octahedral complexes

   b) tetrahedral complexes

   c) square planar complexes

9. The value of spin only moment for a complex with two unpaired electrons is

   a) 2.83 B.M. b) 5.86 B.M. c) 2.56 B.M.

10. How many unpaired electrons are there in a strong field Fe(II) octahedral complex

    a) 0 b) 2 c) 4

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

1. DDT is a pesticide of
   i) Organochlorine ii) Organophosphate iii) Anilide iv) Carbamate
2. Lindane is the
   i) α- isomer ii) β - isomer α- isomer iii) γ – isomer iv) none of these
3. Toxic effect of DDT is due to
   i) benzene ring ii) $-CCl_3$ group iii) –chlorobenzene group iv) none of these
4. Malathion is
   i) Organochlorine ii) Organophosphate iii) Anilide iv) Carbamate
5. Parathion is
   i) Organochlorine ii) Organophosphate iii) Anilide iv) Carbamate
6. Pesticide which contains quinone ring is
   i) Chloranil ii) DDT iii) Gammexane iv) Alachlore
7. Alachlor mainly used as
   i) herbicide ii) antifungal iii) insecticide iv) none of these
8. Butachlor mainly used as
   i) herbicide ii) antifungal iii) insecticide iv) none of these
9. Malathion is detoxified by
   ii) heat ii) UV iii) carboxyesterases iv) none of these
10. Parathion may be rendered nontoxic by application of
    i) alkaline solution ii) acidic solution iii) heat iii) all of them