DUMKAL COLLEGE

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(Govt. Aided, Affiliated to the: University of Kalyani Included under section 2(f) & 12 (B) of UGC Act.)

Notice for submission of internal assignments

Assignments for Semester-V Chemistry Honours Course (CBCS)

Organic

1. Define atom economy and E-factor. What is meant by innocuous solvent? Give Example?

Marks 5

2. What is surfactant? How many types of surfactants are there? Give an example of each.

Marks 5

Inorganic

1. Write down the electronic configuration of Hf^o, La^o, Th^o. Why the value of first ionization energy is less than the second ionization energy of transition elements?   Marks 5

2. Why transition elements are having metallic character? Generally, there is an increase in density from Ti to Cu in the first transition series. Explain   Marks 5

Physical

1. Write the criteria to be Microwave active for Molecules and formulate the expression for the rotational energy of the rigid diatomic molecule by Schrodinger equation. Depict the allowed rotational energies of a rigid diatomic molecule up to J=6   Marks 10

Assignments for Semester-III Honours Course (CBCS)

Organic

1. Write briefly about aromatic electrophilic substitution. Explain with plausible mechanism: Reimer-Tiemann Reaction, Kolbe-Schmidt reaction, Oxymercuration-Demercuration, hydroboration-Oxidation reaction.   Marks 5

2. Discuss about nucleophilic addition to carbonyl compounds.   Marks 5

SEC paper

1. Write down briefly about design and development Central Nervous System agents:

Phenobarbital, Diazepam**.**   Marks 10

Inorganic

1. Briefly write down the postulates of VSEPR theory.   Marks 5
2. Draw the molecular orbital diagram (MO) for O_2 molecule and calculate its bond order and magnetic moment. Comment on its magnetic property.   Marks 5

Physical

1. Define advancement of reaction. Plot variation of free energy with advancement of reaction and in the plot mark the equilibrium state and mention the condition of attaining the equilibrium reaction.   Marks 5
2. Define and derive Compton effect.   Marks 5

Assignments for Semester-I Chemistry Major (NEP-CCF) Course

Organic- Pharmaceutical

1**.** Write a short note on preparation and analysis of aspirin.   Marks 5

2. How will you prepare acyclovir and chloramphenicol?   Marks 5

Inorganic-Physical

1. Derive the Schrödinger wave equation and define each term involved.   Marks 2
2. Calculate the velocity of the electron in the first and second Bohr orbits of the hydrogen atom.   Marks 2
3. Plot radial distribution function and radial probability density curves for 4s, 4p, 4d and 4f orbitals.   Marks 2
4. Define Boyle temperature (T_b) and derive the equation of Boyle temperature from van der Walls equation, Dieterici Equation and Berthelot equation.   Marks 2
5. Find the value of the critical constants from the van der waals equation and prove $P_cV_c/RT_c=3/8$ Marks 2

Assignments for Semester-I Chemistry MDC (NEP-CCF) Course

1. What is meant by pesticides? How to prepare soap? Write down structures of DDT gammaxene, parathion and mention their uses.   Marks 5
2. Write down chemical names of vitamins: vit-A, vit-C, vit-D. Mention their usefulness and effects of deficiency on human beings.   Marks 5

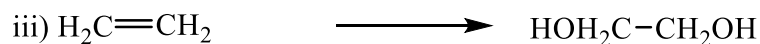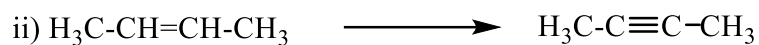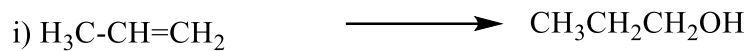## Assignments for First Semester (Minor) and GE Third Semester

1. Write down the electronic configuration of Cu^o and Cr^o. Marks 2

2. Balance the following equation by oxidation state method Marks 2

   $$CuS + HNO_3 \longrightarrow Cu(NO_3)_2 + NO\uparrow + S\downarrow + H_2O$$
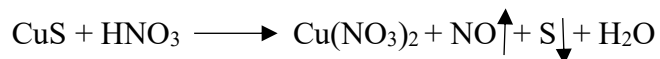
3. State Pauli`s exclusion Principle. Marks 1

4. Carryout the following conversions (any two) Marks 5

   i) $H_3C\text{-}CH\text{=}CH_2 \longrightarrow CH_3CH_2CH_2OH$

   ii) $H_3C\text{-}CH\text{=}CH\text{-}CH_3 \longrightarrow H_3C\text{-}C\equiv C\text{-}CH_3$

   iii) $H_2C\text{=}CH_2 \longrightarrow HOH_2C\text{-}CH_2OH$

Note: Students are requested to submit their assignment on 14th or 15th December, 2023.

By Order

HOD
Department of CHemistry