AJAY KUMAR GARG ENGINEERING COLLEGE, GHAZIABAD
DEPARTMENT OF APPLIED SCIENCE & HUMANITIES
Sessional Test 2

Program: B.Tech
Session: 2024-25
Subject: Engineering Chemistry
Max. : Marks: 50

Semester: Ist
Section: S11-S20
Subject Code: BAS -102
Time: 2 Hours

OBE Remarks:

Q.No	1	2	3	4	5	6	7	8	9	10	11	12
CO No.	CO2	CO2	CO3	CO3	CO3	CO2	CO2	CO2	CO3	CO3	CO2	CO3
Bloom's Level* (L1 to L6)	L1	L5	L2	L1	L5	L4	L5	L2	L1	L2	L1	L3
Weightage CO2: 26.5						Weightage CO3: 23.5						

**Bloom's Level: L1: Remember, L2: Understand, L3: Apply, L4: Analyze, L5: Evaluate, L6: Create*

Note: Answer all the sections.

Section-A (2*5=10)

1. Explain chirality in Drugs with examples.
2. A solution containing 10 g/l of a compound A in a 1 cm cell transmits 55% of light at 410 nm.Calculate the molar absorption coefficient. Given molecular weight of A=80.
3. "IR is often characterized as molecular finger-prints". Comment on it.
4. Write down all the reactions any Primary cell.
5. Calculate the emf of the cell:
   $Cu(s)/Cu^{+2}(.2M)//Ag^{+}(.002M)/Ag(s)$ at 25^0C.
   Write cell reaction. The standard emf of the cell is 1.44V.

Section-B (5*5=25)

6. Describe chemical shift briefly. Why TMS is taken as standard for calculation of chemical shift? A compound has molecular formula C_2H_3Cl.It can show geometrical. The compound has two NMR -Signals. The Splitting, under high resolution of NMR shows one doublet and one triplet. Identify the compound with the help of proper explanation.

$H_2C = CHCl$ Vinyl Chloride

7. Explain Normal modes of vibrations in IR spectroscopy. A compound having molecular formula C_2H_4O while studied for its analysis resulted in the following peaks in its spectrum: 2900-2950cm $^{-1}$,1710 cm $^{-1}$ and 3500-3650cm $^{-1}$. The compound also gave effervesces with Na_2CO_3. Suggest the structure of the compound.

8. What are the possible electronic transitions in UV-visible spectroscopy? A compound shows a UV-Visible absorption band at 400 nm, which shifts to 350 nm upon hydrogenation (addition of hydrogen). Explain how the structure of the compound is related to conjugation, and what structural change occurs upon hydrogenation.

9. Draw flowchart to show various steps involved during the manufacturing of the Portland Cement by rotary kiln method, Also, write the chemical reactions that occur during the process.

10. Why do metal corrodes? Explain oxidation corrosion in detail with Pilling Bedworth rule.

Section-C

(7.5*2=15)

11. What are batteries? Classify them. Explain lead-acid battery with construction, charging and discharging reactions.

12. Define optical isomerism What are the conditions to show optical activity? Give a brief account of optically active compounds having no chiral carbon atom. Why Cis -Trans Nomenclature not applicable everywhere, and which nomenclature is applied then?

Faculty Sign

HoD Sign