#33258 - FALLFR2122CAT2_VL2021220106496_BCHY101L_DEC21_BADAL KUMAR MANDAL

Instructions

Basic Instructions

1. You can freely navigate between different questions forward and backward using **Next** and **Previous** buttons
2. **Finish** button will be enabled only towards the end of the exam.

Instructions for DESCRIPTIVE questions requiring SCAN & UPLOAD

1. Make sure to upload your **scans immediately after you answer** every question. Do NOT wait till the end to **avoid panic at the end**.
2. The exam time is inclusive of time for scanning & uploading answers.
3. If using **laptop + mobile** for the exam, click on **Open Test** on laptop and click on **Scan & Upload** on mobile.
4. If using **laptop + mobile** for the exam, when scanning and uploading from mobile, ensure that the correct question is open on the laptop.
5. When clicking on Camera button on a smart phone for scanning and uploading, you have 2 camera applications available to scan the answer: your phone's **native camera** and an alternative Low Memory Camera. Click on the **Low Memory Camera** in case your browser shows an error due to low memory.

1. Module 3

10 marks per question | 1 display questions | 1 maximum answerable

Q1 (313778) Scan and/or Upload | 10 marks | Hard | CO1

1) Comment on the stability of methyl, isopropyl, tertiary butyl carbocations and arrange them in increasing order.

2) Which of the following intermediates have planar and Tetrahedral molecular geometries? Explain with neat sketches.
i) Methyl cation, ii) Methyl anion, and iii) Methyl radical

Q2 (313779) Scan and/or Upload | 10 marks | Hard | CO1

1) Comment on the stability of methyl, isopropyl, tertiary butyl carbanions and arrange them in increasing order.

2) Is cyclooctatetraene (COT) an aromatic compound? Is it possible to convert it into an aromatic compound? Explain.

Q3 (313780) Scan and/or Upload | 10 marks | Hard | CO1

1) Comment on the stability of methyl, isopropyl, tertiary butyl free radicals and arrange them in increasing order.

2) Characterize the following chemical species as aromatic, nonaromatic, or antiaromatic.

Q4 (313781) Scan and/or Upload | 10 marks | Hard | CO1

1) Comment on the stability of allyl and benzyl free radicals and arrange them in increasing order.

2) [10] annulene is nonaromatic while [18] annulene is antiaromatic – Justify.

2. Module-4

10 marks per question | 1 display questions | 1 maximum answerable

Q1 (313782) Scan and/or Upload **10** marks Hard CO2

i) Distinguish supercapacitors, and batteries.
ii) You have sunlight energy, titanium dioxide layer and dye molecules for electricity generation. Construct the cell using the above ingredients and describe its working principle.

Q2 (313783) Scan and/or Upload **10** marks Hard CO2

1) You want to fabricate your iron spoon with gold. Explain a method to fulfill your job with all relevant cell reactions.
2) Explain the construction and working principle of energy devices used in laptops.

Q3 (313784) Scan and/or Upload **10** marks Hard CO2

1) In the hilly area one military establishment is looking for electrical power for their daily requirements and offices where a normal electrical supply line is not available. Identify a device for the above purpose and demonstrate its working principle with a neat diagram.
2) Which method is based on the seed crystallization for the preparation of a single crystal semiconductor? Discuss it in detail.

Q4 (313785) Scan and/or Upload **10** marks Hard CO2

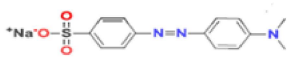
1) How do you eliminate the drawbacks of traditional photovoltaic cells?
2) What is the energy source used in satellites? Describe its working principle with a neat diagram and relevant cell reactions.

3. Module-3-4

10 marks per question | 1 display questions | 1 maximum answerable

Q1 (313786) Scan and/or Upload | 10 marks | Hard | CO3

1) Describe the synthesis of the following dye.



Methyl Orange Dye

2) How do supercapacitors differ from ordinary capacitors?

Q2 (313787) Scan and/or Upload | 10 marks | Hard | CO3

1) Which dye can be synthesized from nitrosonium ion intermediate? Write the reaction mechanism.
2) Doping is necessary for the preparation of different types of semiconductors. How do you classify semiconductors based on doping?

Q3 (313788) Scan and/or Upload | 10 marks | Hard | CO3

1) Write the synthetic route of a blue dye and mention its applications.
2) Which method is based on the difference between solubility of impurities in the molten and solid phases for the preparation of semiconductors? Explain it.

Q4 (313789) Scan and/or Upload | 10 marks | Hard | CO3

1) Explain in detail the chemistry of dyeing. Mention the precautions to be taken during dyeing.
2) Silicon is the most suitable material for solar energy conversion. Explain it with reference to electrolysis of water.