


Name:			
Enrolment No:			
<b>UPES</b> <b>End Semester Examination, May 2024</b>			
<b>Course: Chemistry of New and Advanced Materials</b> <b>Program: Integrated BSc MSc Chemistry</b> <b>Course Code: CHEM3028</b>		<b>Semester: VI</b> <b>Time : 03 hrs.</b> <b>Max. Marks: 100</b>	
<b>Instructions:</b> <ol style="list-style-type: none"> <li>1. Read all questions carefully and attempt questions of one section in one place.</li> <li>2. Question 6 in section B and Question 10 in section C have internal choice questions.</li> <li>3. Use of the calculator is allowed.</li> </ol>			
<b>SECTION A</b> <b>(5Qx4M=20Marks)</b>			
S. No.		Marks	CO
Q 1	Explain high energy materials?	4	CO3
Q 2	Define engineering plastics and mention their properties.	4	CO1
Q 3	Which factors affect the conductivity of an electrolyte?	4	CO2
Q 4	How does magnetism occur in nanocarbons?	4	CO2
Q 5	Illustrate the magnetic domain alignment for paramagnetic and diamagnetic materials when a magnetic field is applied.	4	CO2
<b>SECTION B</b> <b>(4Qx10M= 40 Marks)</b>			
Q 6	Why is Ammonium nitrate considered an explosive?  <b>OR</b>  a) Define solid and liquid propellants. b) What are single color and multicolor rockets?	10  <b>OR</b> (5+5)	CO3
Q 7	How does magnetic coupling happen in $[\text{FeCp}^*_2][\text{TCNE}]$ , where TCNE is tetracyanoethylene.	10	CO2
Q 8	Using Chemical Vapor Deposition, how will you synthesize CNT?	10	CO1
Q 9	Describe the preparation of Acrylonitrile Butadiene Styrene copolymer.	10	CO1
<b>SECTION-C</b> <b>(2Qx20M=40 Marks)</b>			

Q 10	<p>i) Recall the two laws of photochemistry.</p> <p>ii) Describe Direct light induced reactions and photosensitized reactions.</p> <p>iii) Calculate the energy in joules that is associated with (a) one quantum and (b) one Einstein for the wavelength of radiation 590 nm. (Note: <math>h = 6.626 \times 10^{-34}</math> J)</p> <p><b>OR</b></p> <p>i) Define primary and secondary processes in photochemistry.</p> <p>ii) Discuss: Photo-dissociation, Photo-addition, Photo induced rearrangement, photo-substitution, and photo redox reactions.</p>	<p><b>(4+10+6)</b></p> <p><b>OR</b></p> <p><b>(10+10)</b></p>	<p><b>CO3</b></p>
Q 11	<p>What are polarons, bi-polarons, and solitons? Use the example of polyacetylene to describe doping of a polymer to make it conductive.</p>	<p><b>20</b></p>	<p><b>CO3</b></p>