

Name:  
Enrolment No:



## UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, Dec 2024

Programme Name: B. Tech Chemical

Semester : 7th

Course Name : Specialty Chemicals

Time : 3 hr

Course Code : CHCE3046P

Max. Marks: 100

Nos. of page(s) : 02

Instructions : Assume any missing data suitably

S. No.		Mark	CO
1	What is antioxidant synergy? Discuss with an example for application in lubricating oil	6	CO1
2	Discuss briefly the flow-behaviour followed by a mineral oil (as a lubrication oil) above and below the cloud point	6	CO1
3	Analyze at least five (5) types of corrosion inhibitor used in lubricating oil system	6	CO2
4	Explain the classification of additives by physical form.	6	CO2
5	Discuss why sulfur is an important element in Surfactants.	6	CO2
6	Elaborate on the antioxidation mechanism of a primary antioxidant considering a suitable example and relevant reactions.	10	CO3
7	Discuss and assess the different processes occurring from application to effect when an agrochemical is applied to the plant.	10	CO3
8	Explain the reduction of surface tensile with surfactant addition with molecular insight	10	CO3
9	<p>In a 72-hour depuration experiment, the initial concentration of cyetpyrafen (<math>C_0</math>) in plant tissues was measured as 100 <math>\mu\text{g}/\text{kg}</math> (dw). The elimination rate constant (<math>k_3</math>) is <math>0.05\text{h}^{-1}</math>, and the plateau concentration (<math>Y</math>) is 10 <math>\mu\text{g}/\text{kg}</math> (dw).</p> <p>1. What will be the concentration of cyetpyrafen (<math>C_t</math>) in the plant tissues after 24 hours?</p> <p>2. How long will it take for the concentration to reach 20 <math>\mu\text{g}/\text{kg}</math>?</p> <p>The pseudo-first-order decay model is <math>C_t = (C_0 - Y)e^{-k_3t} + Y</math></p>	20	CO4

10	<p>What is The Critical Micelle Concentration (CMC).  Analyze the importance of CMC in surface tension reduction.  Discuss the different measurement techniques of CMC</p> <p>Or</p> <p>Discuss the surface treatment methods of plastics with proper diagram.  How are they effective in achieving better adhesion?</p>	<p>5+5+  10=  20</p> <p>15+5  =20</p>	<p>CO4</p>
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