

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2021

Course: M.Sc.(H) Chemistry
Program: Polymer Chemistry
Course Code: CHEM8013P

Semester: III
Time: 03 hrs.
Max. Marks: 100

Instructions: Read the instructions given below carefully:
All questions are compulsory.

SECTION A

Instructions:

1. Each Question will carry 4 Marks
2. Complete the statement /select the correct answer(s)
3. Answer should be short, fill in blank, true or false.
4. You have to very careful to write the answer.

S. No.		Marks	CO
Q 1	Discuss any two factors that affects glass transition temperature	4	CO2
Q2	With the help of diagram, explain ,various parts of delivery system of the injection molding machine	4	CO3
Q 3	Show the process of Step Polycondensation polymerization using Ethylene Glycol and Adipic acid as monomers unit.	4	CO3
Q 4	An aluminum wire has to be coated using PVC resin. Give the details of molding technique	4	CO1
Q 5	a) The two polymer which occur naturally----- b) The monomer formaldehyde having functionality----- c) Pure polymer can be obtained by ----- polymerization technique d) ----- is also known as pearl polymerization	4	CO3

SECTION B

Instructions:

1. Each question will carry 10 marks
2. There is an internal choice in question 4.
3. Write short/brief notes of 1-2 page answer.
4. Write suitable reactions, to justify your answer as well as to score higher marks.

Q 1	In viscometry method of molecular weight determination, out of USLV and Ostwald viscometer which apparatus you would suggest and why?	10	CO2
Q 2	Give reasons: i) Free radical polymerization is carried out in an inert atmosphere. ii) Prerequisite criterion for a monomer to get polymerized. iii) Suspension polymerization also known as bead polymerization. iv) Polypropylene is more prone to oxidation than polyethylene. v) Plasticizers are added to polyvinylchloride. vi) Polyvinylchloride is more polar than polyethylene. vii) Polyvinylchloride is further chlorinated. viii) Polystyrene mainly occurs in atactic form. ix) Molecular weight of polymers is expressed as average x) PMMA is used for making the sign boards	10	CO3
Q 3	To process PET into bislery bottles, give details of process that you will suggest.	10	CO1
Q 4	What are Co-polymers? In some applications, why it is preferred over Homopolymers. Give suitable example to support your answer. With the help of diagram, explain types of copolymers OR Explain the morphology of polymer with temperature variation mentioning about glass transition temperature and the various other stages involved during transition.	10	CO3
SECTION C			
Instructions:			
1. Each Question is of 20 marks 2. Write long answer. 3. Draw the neat diagram, to justify your answer as well as to score higher marks. <u>4. Internal choices is there attempt any one of them in question 2</u>			
Q 1	A polymer is soluble in water, Explain, in detail the polymerization technique that you would suggest and why? Compare transfer molding with compression molding technique.	10+10	CO1
Q 2	Discuss in detail any two methods to determine the glass transition temperature. OR Discuss in detail any two methods to determine the Molecular Weight of Polymers	20	CO2