

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2020

Course: Polymer Chemistry
Programme: M. Sc. Chemistry
Course Code: CHEM8013

Semester: III
Time: 3 hours
Max. Marks: 100

SECTION A

1. Each Question will carry 5 Marks

2. Instruction: Complete the statement / Select the correct answer(s)

S. No.	Question	Marks	CO
Q 1	a) Which of the following is a natural polymer used in nanoparticles. A. Polycaprolactone B. Polylactic acid C. Alginate D. Polystyrene b) Biomedical polymer should possess _____, _____, _____ characteristics.	2 3	CO3
Q 2	a) A polymeric implant that is biodegradable A. Prepared from silicone B. Prepared from Polyurethane C. Prepared from Polylactic acid D. Prepared from polyacrylate b) Define biomaterial.	2 3	CO3
Q 3	a) Chitosan is a _____ mucoadhesive polymer A. Cationic B. Anionic C. Synthetic D. Non-ionic b) Identify True/False statements (i) Polyethylene used for preparing heart valves (ii) Polymethyl methacrylate used in contact lenses (iii) Polyvinyl chloride is used in disposable syringes	2 3	CO3
Q 4	Give reason: i) Suspension polymerization is known as bead polymerization. ii) PVC is used for making electrical fittings. iii) Elemental composition of polymers in step growth polymerization is different from the monomers. iv) Polymers synthesized using bulk polymerization can directly be sent to molding station. v) The amount of surfactant added to emulsion polymerization should cross CMC.	5	CO1

Q 5	<p>Explain:</p> <ul style="list-style-type: none"> i) Free radical polymerization is carried out in an inert atmosphere. ii) Prerequisite criterion for a monomer to be polymerized. iii) Polypropylene is more prone to oxidation than polyethylene. iv) Polyvinylchloride is further chlorinated. v) Polystyrene mainly occurs in atactic form. 	5	CO3
Q 6	Find weight average molecular weight for PP given its degree of polymerization as 10,000.	5	CO2
SECTION B			
<p>1. Each question will carry 10 marks 2. Instruction: Write short / brief notes</p>			
Q 7	Define Elastomers and write the characteristic properties and uses of Nitrile rubber?	10	CO2
Q 8	What factors influences polymer processing? Briefly discuss about the phases involved in polymer processing.	10	CO1
Q 9	What are the deficiencies of natural rubber? What advantages do we achieved by the Vulcanization process?	10	CO3
Q 10	Taking examples, discuss different methods by which termination of a growing polymer chain can be brought about.	10	CO2
Q 11	Discuss Ebulliometry or Cryoscopy as a method to determine molecular weight of polymer.	10	CO2
Section C			
<p>1. Each Question carries 20 Marks. 2. Instruction: Write long answer.</p>			
Q 12	<p>Discuss about the importance of the following compounding ingredients in detail</p> <ul style="list-style-type: none"> (i) Plasticizer (ii) Filler (iii) Resin (iv) Catalyst <p style="text-align: center;">OR</p> <p>Describe Compression molding with schematic diagram and mention the advantages.</p>	20	CO1