

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086  
(For candidates admitted from the academic year 2015-16)

SUBJECT CODE: 15CH/ME/PL55

B.Sc. DEGREE EXAMINATION, APRIL 2018  
BRANCH IV - CHEMISTRY  
SIXTH SEMESTER

COURSE : MAJOR-ELECTIVE  
PAPER : POLYMER CHEMISTRY  
TIME : 3 HOURS

MAX. MARKS : 100

SECTION – A  
ANSWER ALL THE QUESTIONS

(30x1=30)

I. Choose the correct answer:

- Compound that retards polymer degradation  
a) anti oxidant      b) accelerator      c) inhibitor      d) stabilizer
- Low molecular weight polysaccharide  
a) oligosaccharide      b) nucleotide      c) polypeptide      d) nucleoside
- Cellulose obtained by precipitation from solution  
a) regenerated cellulose      b) resins      c) racked rubber      d) none of the above
- Term used for the tensile strength of a polymer  
a) Tenacity      b) Tacticity      c) Transcription      d) none of the above
- Polymerisation of a macromer without added solvents or water is  
a) bulk polymerisation      b) solution polymerisation  
c) suspension polymerisation      d) emulsion polymerisation
- Polymers containing one reactive end group  
a) monomer      b) telechelic      c) trifunctional monomer      d) none of the above
- Temperature at which the onset of local mobility begins  
a) glass transition temperature      b) index of refraction  
c) oxygen index      d) none of the above
- Regenerated cellulose film is  
a) cellophane      b) co-extruded film      c) hemp      d) latex
- Polymers containing –Si-O- backbones are  
a) silicones      b) sodalime glass      c) sandstone      d) soda ash
- Polymers based on co-ordination complexes are  
a) co-ordination polymers      b) ionic polymers      c) FRP      d) addition polymers

II. Fill in the blanks:

- Polymers with two to ten repeat units are called -----.
- Mixture of polymer chains of different lengths is -----.
- Inherent viscosity is given by the expression-----.
- Arithmetic mean value obtained by dividing the sum of the molecular weight by the number of molecules is -----.
- Second power average of Molecular weight, dependant on the size of the particular chain is -----.
- Polymer produced by condensation of phenol-formaldehyde is -----.

17. Number of active functional groups present in a molecule is -----.
18. The polymer that is widely used in contact lens is -----.
19. Synthetic polyamide is -----.
20. Trade name for PET fiber is -----.

**III. State whether true or false:**

21. Atactic polymer in which there is random arrangement of pendant groups on each side of the chain.
22. Polymer with ordered structure is crystalline polymer.
23. Hard brittle state below T<sub>g</sub> is in rubbery state.
24. Polymer where the geometry of the pendant groups are all on the same side of the polymer backbone is called isotactic
25. Monodisperse is polymer mixture made up of molecules of one specific molecular weight end group.

**IV. Answer in a line or two:**

26. Bio-degradable polymer
27. Thermal degradation
28. Photo degradation
29. Vulcanisation
30. Synthetic rubber

**SECTION – B****ANSWER ANY FIVE QUESTIONS:****(5x6=30)**

31. Classify polymers based on origin, structure & thermal processes.
32. What is Stereo specificity? Explain optical isomerism in detail.
33. What is T<sub>g</sub>? Mention the factors influencing them.
34. Explain Co-ordination polymerization in detail.
35. Discuss briefly on vulcanization of rubber..
36. Explain the Hydrolysis & Acidolysis reactions of polymers.
37. What is meant by Cyclization reaction of polymers?

**SECTION – C****ANSWER ANY TWO QUESTIONS:****(2x20=40)**

38. Give the structure, properties & applications of
  - a) PU
  - b) PVC
  - c) PMMA
  - d) silicones
39. a) Write the mechanisms involved in Free radical polymerization.  
b) Discuss briefly on Bulk polymerization & Solution polymerization techniques.
40. a) Define M<sub>n</sub> & M<sub>w</sub>.  
b) How the molecular weights of the polymer are determined? Discuss any one technique in detail.

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