STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86
(For candidates admitted during the academic year 2011-12 & thereafter)

SUBJECT CODE: 11CH/PE/PM14

M.Sc. DEGREE EXAMINATION, NOVEMBER 2014
BRANCH IV- CHEMISTRY
FIRST SEMESTER

REG.NO ……..

COURSE : ELECTIVE
PAPER : POLYMER MATERIALS AND APPLICATIONS
TIME : 30 MINUTES **MAX.MARKS : 20**

SECTION – A

TO BE ANSWERED ON THE QUESTION PAPER ITSELF

ANSWER ALL QUESTIONS: **(20 x 1 = 20)**

I CHOOSE THE CORRECT ANSWER:

1. Which will have the higher Tg?
   a) poly (acrylate) b) poly (methyl acrylate)
   c) poly (ethyl acrylate) d) poly (bertyl acrylate)

2. Which of the following is an initiator?
   a) Azo-bis-iso butyronitrite b) Nitrobenzene
   c) diphenyl picryl hydrazide d) Hydroquinone

3. Which would be more flexible?
   a) poly (methyl acrylate) b) poly (methyl methacrylate)
   b) poly (vinyl carbazole) d) cellulose nitrate

4. What is the repeating unit in Bakelite?
   a) phenol – HCHO b) urea – HCHO
   c) melamine – HCHO d) vinyl carbonate

II FILL IN THE BLANKS:

5. Polymer obtained by reacting phenol with formaldehyde is _____.
6. The catalyst & cocatalyst widely used in Ziegler Natta polymerisation is _____ + _____.
7. Monomer _____ is used to produce poly(vinyl alcohol).
8. The thermal instrumental technique _____ is used to determine Tg.

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III STATE WHETHER TRUE OR FALSE:

9. Lubricants are added to improve the flow characteristics of a material during its processing.
10. Antioxidants retard oxidative degradation.
11. Plasticizers enhance flexibility.
12. UV stabilizers doesnot quench UV radiation.

IV MATCH THE FOLLOWING:

13. Composites	-	(a) poly (Chloroprene)
14. Vulcanisation	-	(b) adhesives that causes cross-linking
15. Curing	-	(c) cross linking with sulphur
16. Neoprene	-	(d) fibres embedded in matrix or resin

V ANSWER IN A LINE OR TWO:

17. Differentiate configuration from conformation.

18. Spherulites

19. Tacticity

20. Mark-Houwink equation

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TIME : 2½ HOURS **MAX.MARKS : 80**

SECTION – B

ANSWER ANY FIVE QUESTIONS: **(5 x 8 = 40)**

1. Distinguish between addition & condensation polymerisation with suitable examples.
2. Give the structure, properties & applications of
   a) PU b) PMMA
3. Explain group transfer polymerisation.
4. What are stereo-regular polymers? Explain.
5. Write notes on polysaccharides as macromolecules.
6. Discuss thermal & photo degradation of polymers.
7. How would you identify where a sample is poly(vinyl acetate) or poly(vinyl alcohol) or the basis of IR spectroscopy?

SECTION – C

ANSWER ANY TWO QUESTIONS: **(2 x 20 = 40)**

8. a) What is Tg? What factors influence the Tg?
   b) Account for mechanical & thermal properties of polymers.
   c) Discuss silicone polymers. (7+7+6)

9. a) Discuss moulding technique for the fabrication of plastic articles.
   b) Discuss Flory-Higgins theory.
   c) Explain Newtonian behaviour of polymers. (7+7+6)

10. a) Explain the free-radical polymerisation mechanism.
    b) Describe determination of molecular weight by light scattering method. (10+10)

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