

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86
(For candidates admitted during the academic year 2008–09)

SUBJECT CODE: CH/ME/PL34

B.Sc. DEGREE EXAMINATION, NOVEMBER 2009
BRANCH IV- CHEMISTRY
THIRD SEMESTER

REG.NO

COURSE : MAJOR ELECTIVE
PAPER : POLYMER CHEMISTRY
TIME : 30 MINUTES

MAX.MARKS : 30

SECTION – A

(30x1=30)

ANSWER ON THE QUESTION PAPER ITSELF:

Answer all the questions:

Choose the correct answer the following:

- Disposable materials are made up of
a) PMMA b) PU c) PVC d) Silicones
- Polyester is an example of
a) Suspension polymerisation b) Interfacial polymerisation
c) Bulk polymerisation d) High pressure polymerization
- T_g of a polymer depends on
a) chain geometry b) chain flexibility
c) molecular aggregates d) all the above
- Which among the following undergoes cationic polymerisation.
a) styrene b) butadiene c) acrylonitrile d) Isobutylene
- Polymers with amide linkage can undergo easily.
a) Acidolysis b) Hydrolysis c) Aminolysis d) Ahydrogenation

Fill in the blank:

- The world's most widely used plastic is _____
- The expansion of MBT is _____
- Nylon 6 has high T_g because of the presence of _____ in the molecule.
- The density of the crystalline component is _____ than that of the amorphous component.
- _____ is used as filter to reinforce silicone rubbers.

State whether the following statements are true or false:

11. Condensation polymerisation is also known as step wise polymerisation.
12. PMMA is used as a TV screen guard.
13. Araldite also comes under thermoplastics.
14. Polyvinyl carbazole is very easy to crystallize.
15. Degree of polymerisation decreases with an increase of temperature.
16. Polymers with a symmetrical structure are non-crystalline.
17. Zinc is used as stabilizer for PVC.
18. Methyl formate is formed during the photo degradation of solid PMMA.
19. $T_g = \frac{1}{2}T_m$ for unsymmetrical polymers.
20. Polyphenylene is thermally more stable than polycarbonate.

Match the following:

- | | | |
|---------------------|---|-------------------|
| 21. Sealing wax | - | poly urethane |
| 22. Ebonite | - | thermoplastic |
| 23. Thermocole | - | Natural rubber |
| 24. Paladium gutter | - | Vulcanised rubber |
| 25. Plexiglass | - | PMMA |

Answer in a line or two:

26. What is an Atactic polymer?
27. What are silicones?
28. How styrene rubber is obtained?
29. What are plasticiser ?
30. What type of synthetic rubber is suitable for making cycle tubes & automobile tubes?



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MAX.MARKS : 70

SECTION – B

5X6=30

Answer any five questions.

1. Discuss any two industrial applications of the following
(i) Polyacrylates (ii) silicones (iii) Emulsions
(2+2+2)
2. Write a short note on Synthetic & Natural fibers. (3+3)
3. Explain the kinetics of free radical chain polymerisation.
4. Explain the term glass-transition temperature & mention its importance.
5. What do you understand by crystallinity? How is it related to polymer structure?
6. Explain the following polymer reactions with an example.
(i) Acidolysis (ii) Substitution reaction
7. Write a note on biodegradable Polymers.

SECTION – C

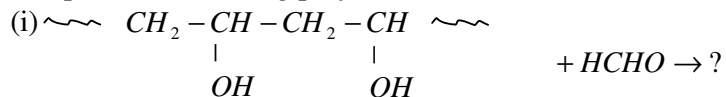
2X20=40

Answer any two questions.

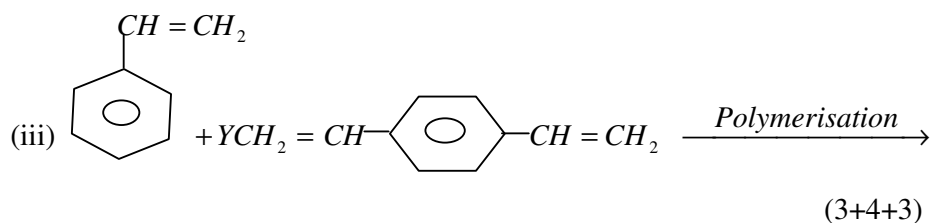
8. a) Discuss the need for recycling of polymers. (8)
b) Indicate the mechanism involved in anionic polymerisation & Addition polymerisation with an example. (6+6)
9. a) Explain the significance of Zeigler-Natta catalyst in polymerisation reaction.
b) Write short notes on stereoregular polymers.
(10+10)

10. a) Discuss the end group analysis for the determination of molecular weight of the polymer. (10)

- b) Complete the following polymer reaction



- (ii) Polyacrylonitrile $\xrightarrow{\Delta} ?$



11. a) What do you understand by the term polymer degradation. Explain mechanical & chemical degradation methods with an example. (2+5+5)

- b) How is natural rubber obtained? How does it differ from gutta percha? What is the necessity for vulcanization? (3+2+3)

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