0125273

K19P 1082

Reg. No. : .....

Name : .....

III Semester M.Sc. Degree (CBSS- Reg./Suppl./Imp.)

Examination, October-2019

(2014 Admission Onwards)

CHEMISTRY

CHE 3E 03 : POLYMERS AND MATERIAL CHEMISTRY

Time : 3 Hours Max. Marks : 60

SECTION - A

Answer **all** questions. **Each** question carries **one** mark.

1. Name the product formed from the reaction of a phenol with formaldehyde.
2. Draw representative structures for (a) alternation copolymer, (b) random copolymer, (c) block copolymer and (d) graft copolymer of any two monomers, say 'A' and 'B'.
3. How many amino groups are present in each molecule of nylon-66 made from an excess of hexamethylenediamine?
4. Under what conditions are the weight-and number- average molecular weight the same.
5. Name any two cross linking agents used in polymer industry.
6. Give a specific application of chloromethyl functionalized polystyrenes.
7. Name one naturally occurring ore of tungsten.
8. Give the composition of a zinc base casting alloy.

SECTION - B

Answer any **Eight** questions. Answer may be in **two or three** sentences. Each question carries **two** marks.

9. What is living polymerization? Give an example.
10. Illustrate various conformation observed in polymeric chain with a specific example.

P.T.O.

11. Explain the effect of temperature and pressure on chain polymerization.
12. Explain why the viscosity of polymer solution decreases as the temperature increases.
13. Which will yield the higher apparent molecular weight values in the light—scattering method:

    (a) a dust free system or (b) one in which dust particles are present? Why?
14. What are the colligative methods for measuring molecular weight and what kind of molecular weight do you get?
15. Exemplify gas phase polymerization reaction.
16. Briefly explain the process of vulcanization.
17. Give any two examples of polymer blends along with their specific properties.
18. What are ferrites? What is their importance?
19. Explain the technical importance of porous metallic bearing.
20. Exemplify hybrid composites with their applications.

SECTION - C

Answer any **Four** questions **each** in a paragraph. **Each** question carries **3** marks.

21. How gelation happens with polymers. Explain the concept of gel point and how it can be estimated.
22. Discuss about various mechanical properties associated with crystalline polymers.
23. What are the driving forces for polymer solubility?
24. Write a short note on end group analysis for the measurement of molecular weight of polymers.
25. Differentiate between polymerization in homogeneous and heterogeneous systems.
26. Explain the post reactions of polymers for the preparation of graft and block polymers.

27. Write a short note on the various casting alloys used in the tool and die industry.

28. Give the properties and application of refractory materials with specific examples.

SECTION - D

Answer either **A or B** of each question. **Each** question carries **6** marks.

29. A) Comment about the glass transition temperature (T_g) of polymers? How it can be measured and what are the factors affecting T_g?

(OR)

B) Inorganic compounds play a crucial role in the preparation of stereo regular polymers. Justify the statement.

30. A) Give the principle and illustrate the GPC method used for the fractionation of polymers.

(OR)

B) Discuss Flory Huggins theory of polymer solutions.

31. A) Explain the solid phase polymerization, giving emphasis to protein synthesis.

(OR)

B) Discuss various methods of degradation of polymers.

32. A) Discuss briefly the synthesis, properties and applications of ceramic materials.

(OR)

B) Explain the various magnetic properties of materials used in the engineering industry.
