Questions CT-3 BTech Chemistry Dec 2022

Chemistry (SRM Institute of Science and Technology)

SRM INSTITUTE OF SCIENCE & TECHNOLOGY

DEPARTMENT OF CHEMISTRY
College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur – 603203

SET – I

INTERNAL ASSESSMENT – III

Program: B.Tech
Course Code & Title:21CYB101J & Chemistry
Year & Sem: I Year & I Sem

Date: 13/12/2022
Duration: 08.00 – 09.00 AM
Max. Marks: 30

Part – A (10 x 1 = 10 Marks)
Answer ALL The Questions

1. Which of the following monomers are unsuitable for condensation polymerization?
   a) propanoic acid and ethanol b) butane-dioic acid and glycol c) diamines and dicarboxylic acids d) hydroxy acids
2. Pthalic acid reacts with glycerol to give ……..
   a) branch polymer b) cross linked polymer c) linear polymer d) graft polymer
3. Buna-N rubber is ……..
   a) Styrene-butadiene b) Chloroprene c) Neoprene d) Acrylonitrile butadiene
4. Consider the following statements for condensation polymerization :
   I. Bifunctional or polyfunctional monomers
   II. Loss of each kind of functional group in each step for bifunctional species
   III. Always accompanied by the release of a byproduct molecule
   IV. Monofunctional or polyfunctional monomers
   Which of the following are true?
   a) I and IV b) I, II and III c) I and II d) III and IV
5. Which of the following monomers cannot undergo chain growth polymerization?
   a) $CH_2= CH_2$ b) $CH_2=CHCN$ c) $COOH-CH_2-COOH$ d) $CH_2=CHCOOR$
6. Which one of the below can be used as an insulator and also as a lubricant?
   a) Polypropylene b) PTFE c) Nylon d) Polyurethane
7. Intermolecular forces of thermoplastic polymers are ……
   a) more than elastomers b) between elastomers and fibres c) same as elastomers d) more than fibres
8. Glass transition temperature (T_g) for Nylon-66 is 50 °C, which is higher than polyethylene due to _____
   a) Vander Waals forces b) covalent bonding c) Inter-molecular hydrogen bonding d) Intra-molecular hydrogen bonding
9. Minimum interplanar spacing required for Bragg's diffraction is ……
   a) $\lambda/4$ b) $\lambda/2$ c) 2λ d) λ
10. Which among the following polymers have lowest solubility?
    a) polyethylene b) polystyrene c) epoxy resin d) nylon-66

Part – B (2 x 10 = 20 Marks)

11. a. Write the preparation, properties, and applications of the following polymers: i. PTFE ii. Polyurethane and iii. Nylon-66 (10 marks)

(OR)

b. i. Compare and contrast syndiotactic and isotactic polymers. Provide suitable examples. (6 marks)

ii. Elucidate with an example 'p-doping' conducting polymer (4 marks)

12. a. With a neat sketch, discuss the principle, instrumentation and applications of XPS. (10 marks)

(OR)

b. i. Define Miller indices. Compute the Miller indices for a plane intersecting at x= 1/4, y=1, and z=1/2. (4 marks)

ii. Suggest the products and provide suitable equations when 1, 3 – butadiene reacts with the following i. Acrylonitrile ii. Styrene (6 marks)

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SET – II

INTERNAL ASSESSMENT – III

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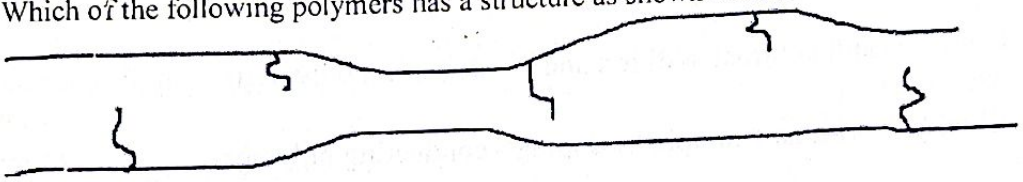
Course Code & Title:21CYB101J & Chemistry
Year & Sem: I Year & I Sem

Date: 13/12/2022
Duration: 08.00 – 09.00 AM
Max. Marks: 30

Part – A (10 x 1 = 10 Marks)
Answer ALL The Questions

1. Which of the following polymers has a structure as shown below?



a) Low-density polythene b) High-density polythene c) Polyvinyl chloride d) Bakelite

2. Which of the following does not have dipole-dipole interactions?
a) Nylon b) Terylene c) Dcaron d) Nylon
3. Buna-S rubber is .....
a) Styrene-butadiene b) Chloroprene c) Neoprene d) Acrylonitrile butadiene
4. The reaction mixture of addition polymerization contain at any instant of time :
I. Full grown polymer molecules
II. Unreacted monomer molecules
III. Free radical chains and initiators
Which of the above statements are correct?
a) I and II b) I, II and III c) I and III d) III only
5. Monomer used in the synthesis of neoprene is .....?
a) CH_2= CHCl b) CH_2=CHCN c) CH_2= CCl-CH= CH_2 d) CCl_2=CCl_2
6. Hemodialysis tubes are made with .....
a) Polypropylene b) Thermoplastic polyurethane c) Nylon d) Polyurethane intermediate
7. Elastomers have the general structure of .....
a) flexible linear chains b) rigid three dimensional network c) linear cross linked chains d) rigid linear chains
8. Glass transition temperature (T_g) for Nylon-66 is 50 °C, which is higher than polyethylene due to _____
a) Vander Waals forces b) covalent bonding c) Inter-molecular hydrogen bonding d) Intra-molecular hydrogen bonding

9. If X-ray of wavelength 100 Å is incident on an atom at an angle of 90°, then what should be the value of d for first-order spectrum?

a. 30 Å b. 40 Å c. 50 Å d. 60 Å

10. Which of the following kind of polymers are known for their high crystallinity?

a) random b) isotactic c) atactic d) syndiotactic

Part – B (2 x 10 = 20 Marks)

11. a. Write the preparation, properties, and applications of the following polymers:
i. Polypropylene ii. Polystyrene iii. PET (10 marks)

(OR)

b. i. Compare and contrast addition and condensation polymerisation. Provide suitable examples (6 marks)

ii. Elucidate with an example 'n-doping' conducting polymer (4 marks)

12. a. i. Explain the principle and applications of XPS. (6 marks)

ii. Compute the Miller indices for a plane intersecting at x= ¼, y=1, and z=1/2.

(OR)

b. i. With a neat sketch derive Bragg's law.

(5 marks)

ii. How polymers are classified based on origin and nomenclature? (5 marks)

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