

Polymers

1. Buna-N synthetic rubber is a copolymer of [AIEEE-2009]

- $\text{H}_2\text{C} = \text{CH} - \text{CH} = \text{CH}_2$ and $\text{H}_5\text{C}_6 - \text{CH} = \text{CH}_2$
- $\text{H}_2\text{C} = \text{CH} - \text{CN}$ and $\text{H}_2\text{C} = \text{CH} - \text{CH} = \text{CH}_2$
- $\text{H}_2\text{C} = \text{CH} - \text{CN}$ and $\text{H}_2\text{C} = \text{CH} - \overset{\text{CH}_3}{\underset{\text{Cl}}{\text{C}}} = \text{CH}_2$
- $\text{H}_2\text{C} = \text{CH} - \overset{\text{Cl}}{\underset{\text{C}}{\text{C}}} = \text{CH}_2$ and $\text{H}_2\text{C} = \text{CH} - \text{CH} = \text{CH}_2$

2. The polymer containing strong intermolecular forces e.g. hydrogen bonding, is [AIEEE-2010]

- Natural rubber
- Teflon
- Nylon 6, 6
- Polystyrene

3. Thermosetting polymer, Bakelite is formed by the reaction of phenol with [AIEEE-2011]

- HCOOH
- $\text{CH}_3\text{CH}_2\text{CHO}$
- CH_3CHO
- HCHO

4. The species which can best serve as an initiator for the cationic polymerization is [AIEEE-2012]

- HNO_3
- AlCl_3
- BuLi
- LiAlH_4

5. Which one is classified as a condensation polymer? [JEE (Main)-2014]

- Dacron
- Neoprene
- Teflon
- Acrylonitrile

6. Which polymer is used in the manufacture of paints and lacquers? [JEE (Main)-2015]

- Bakelite
- Glyptal
- Polypropene
- Poly vinyl chloride

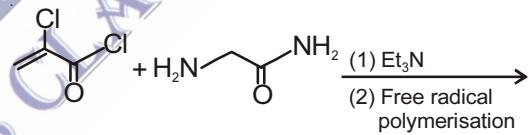
7. Which of the following statements about low density polythene is FALSE? [JEE (Main)-2016]

- It is a poor conductor of electricity
- Its synthesis requires dioxygen or a peroxide initiator as a catalyst
- It is used in the manufacture of buckets, dustbins etc.
- Its synthesis requires high pressure

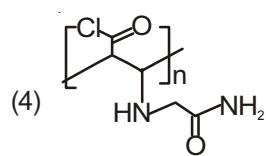
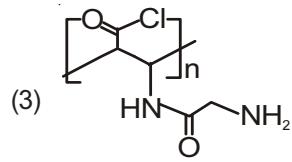
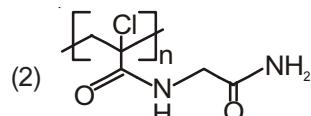
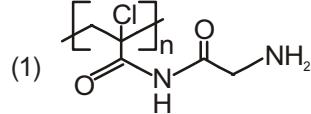
8. The formation of which of the following polymers involves hydrolysis reaction? [JEE (Main)-2017]

- Nylon 6, 6
- Terylene
- Nylon 6
- Bakelite

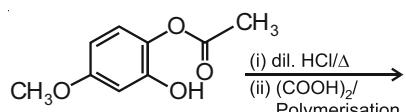
9. Major product of the following reaction is



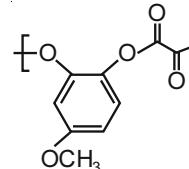
[JEE (Main)-2019]

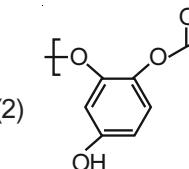


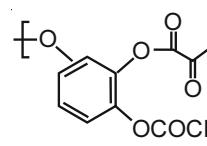
10. The major product of the following reaction

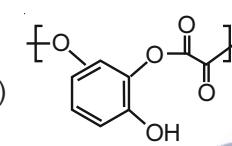


[JEE (Main)-2019]

- (1) 

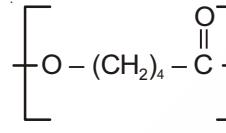
(2) 

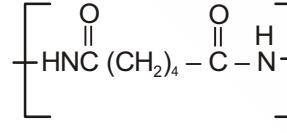
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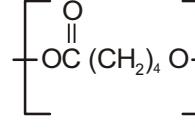
(4) 

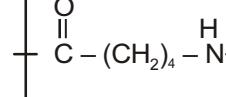
11. The polymer obtained from the following reactions

$\text{HOOC-CH}_2\text{CH}_2\text{CH}_2\text{NH}_2 \xrightarrow{\substack{\text{(i) } \text{NaNO}_2/\text{H}_3\text{O}^+ \\ \text{(ii) Polymerisation}}} \text{[JEE (Main)-2011]}$

(1) 

(2) 

(3) 

(4) 

12. The homopolymer formed from 4-hydroxy-butanoic acids is [JEE (Main)-2019]

- | | | | |
|-----|--|-----|---|
| (1) | $\left[\begin{array}{c} \text{O} \\ \parallel \\ \text{C}(\text{CH}_2)_3-\text{O} \end{array} \right]_n$ | (2) | $\left[\begin{array}{c} \text{O} \\ \parallel \\ \text{C}(\text{CH}_2)_2\text{C}-\text{O} \end{array} \right]_n$ |
| (3) | $\left[\begin{array}{c} \text{O} \\ \parallel \\ \text{OC}(\text{CH}_2)_3-\text{O} \end{array} \right]_n$ | (4) | $\left[\begin{array}{c} \text{O} \\ \parallel \\ \text{C}(\text{CH}_2)_2\text{C} \\ \parallel \\ \text{O} \end{array} \right]_n$ |

13. Poly- β -hydroxybutyrate-co- β -hydroxyvalerate (PHBV) is a copolymer of . [JEE (Main)-2019]

- (1) 3-hydroxybutanoic acid and 4-hydroxypentanoic acid
 - (2) 3-hydroxybutanoic acid and 2-hydroxypentanoic acid
 - (3) 2-hydroxybutanoic acid and 3-hydroxypentanoic acid
 - (4) 3-hydroxybutanoic acid and 3-hydroxypentanoic acid

14. The two monomers for the synthesis of nylon 6, 6 are **[JEE (Main)-2019]**

- (1) HOOC(CH₂)₆COOH, H₂N(CH₂)₄NH₂
(2) HOOC(CH₂)₆COOH, H₂N(CH₂)₆NH
(3) HOOC(CH₂)₄COOH, H₂N(CH₂)₆NH₂
(4) HOOC(CH₂)₄COOH, H₂N(CH₂)₄NH₂

15. 0.27 g of a long chain fatty acid was dissolved in 100 cm³ of hexane. 10 mL of this solution was added dropwise to the surface of water in a round watch glass. Hexane evaporates and a monolayer is formed. The distance from edge to centre of the watch glass is 10 cm. What is the height of the monolayer?

[Density of fatty acid = 0.9 g cm⁻³; $\pi = 3$]

[JEE (Main)-2019]

- (1) 10^{-8} m (2) 10^{-4} m
 (3) 10^{-2} m (4) 10^{-6} m

16. The structure of Nylon-6 is [JEE (Main)-2019]

- (1) $\left\{ (\text{CH}_2)_4 - \overset{\text{O}}{\underset{\text{H}}{\text{C}}} - \text{N} \right\}_n$ (2) $\left\{ \overset{\text{O}}{\underset{\text{H}}{\text{C}}} - (\text{CH}_2)_6 - \text{N} \right\}_n$

(3) $\left\{ (\text{CH}_2)_6 - \overset{\text{O}}{\underset{\text{H}}{\text{C}}} - \text{N} \right\}$ (4) $\left\{ \overset{\text{O}}{\underset{\text{H}}{\text{C}}} - (\text{CH}_2)_5 - \text{N} \right\}$

17. Match the catalysts (Column I) with products (Column II).

| Column I | Column II |
|----------------------|------------------|
| Catalyst | Product |
| A) V_2O_5 | (i) Polyethylene |
| B) $TiCl_4/Al(Me)_3$ | (ii) Ethanal |
| C) $PdCl_2$ | (iii) H_2SO_4 |
| D) Iron Oxide | (iv) NH_3 |

- (1) (A)-(iv); (B)-(iii); (C)-(ii); (D)-(i)
 (2) (A)-(iii); (B)-(iv); (C)-(i); (D)-(ii)
 (3) (A)-(iii); (B)-(i); (C)-(ii); (D)-(iv)
 (4) (A)-(ii); (B)-(iii); (C)-(i); (D)-(iv)
18. The major product of the following reaction is
- [JEE (Main)-2019]**
- (1)
 (2)
 (3)
 (4)
19. Which of the following compounds is a constituent of the polymer ?
- [JEE (Main)-2019]**
- (1) Formaldehyde (2) Ammonia
 (3) Methylamine (4) N-Methyl urea
20. Which of the following is a condensation polymer?
- [JEE (Main)-2019]**
- (1) Nylon 6, 6 (2) Teflon
 (3) Buna - S (4) Neoprene
21. The correct match between Item-I and Item-II is
- | | Item – I | | Item – II |
|-----|------------------------|-------|---|
| (a) | High density polythene | (I) | Peroxide catalyst |
| (b) | Polyacrylonitrile | (II) | Condensation at high temperature and pressure |
| (c) | Novolac | (III) | Ziegler – Natta Catalyst |
| (d) | Nylon 6 | (IV) | Acid or base catalyst |
- [JEE (Main)-2019]**
- (1) (a) → (III), (b) → (I), (c) → (IV), (d) → (II)
 (2) (a) → (III), (b) → (I), (c) → (II), (d) → (IV)
 (3) (a) → (IV), (b) → (II), (c) → (I), (d) → (III)
 (4) (a) → (II), (b) → (IV), (c) → (I), (d) → (III)
22. Which of the following is a thermosetting polymer?
- [JEE (Main)-2019]**
- (1) PVC (2) Buna-N
 (3) Bakelite (4) Nylon 6
23. The correct name of the following polymer is
-
- [JEE (Main)-2019]**
- (1) Polyisobutane (2) Polyisoprene
 (3) Polyisobutylene (4) Polytert-butylene
24. Which polymer has 'chiral' monomer(s)?
- [JEE (Main)-2020]**
- (1) Buna-N (2) PHBV
 (3) Neoprene (4) Nylon 6, 6
25. Which one of the following polymers is not obtained by condensation polymerisation?
- [JEE (Main)-2020]**
- (1) Buna-N (2) Nylon 6
 (3) Bakelite (4) Nylon 6, 6

26. Consider the Assertion and Reason given below.

[JEE (Main)-2020]

Assertion (A) : Ethene polymerized in the presence of Ziegler Natta Catalyst at high temperature and pressure is used to make buckets and dustbins.

Reason (R) : High density polymers are closely packed and are chemically inert.

Choose the correct answer from the following:

- (1) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- (2) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
- (3) (A) is correct but (R) is wrong
- (4) (A) and (R) both are wrong

27. The correct match between Item - I and Item - II is

| Item - I | Item - II |
|--------------------|-------------------------------------|
| (a) Natural rubber | (I) 1, 3-butadiene + styrene |
| (b) Neoprene | (II) 1, 3-butadiene + acrylonitrile |
| (c) Buna-N | (III) Chloroprene |
| (d) Buna-S | (IV) Isoprene |

[JEE (Main)-2020]

- (1) (a) - (III), (b) - (IV), (c) - (I), (d) - (II)
- (2) (a) - (IV), (b) - (III), (c) - (II), (d) - (I)
- (3) (a) - (III), (b) - (IV), (c) - (II), (d) - (I)
- (4) (a) - (IV), (b) - (III), (c) - (I), (d) - (II)

