CHEMISTRY

FOR IIT JEE ASPIRANTS OF CLASS 12 FOR CHEMISTRY

POLYMERS

Examples

1. Which of the following is an examples of fibrous protein?

A. Natural Polymer

B. Synthetic Polymer

C. Semi synthetic Polymer

D. None of these

Answer: A

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2. Thermoplastics are the polymers

A. Linear polymers

B. Highly cross linked polymers

C. Both(1) & (2)

D. Crystalline

Answer: A

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3. Which of the following polymers are biodegradable polymer of polyamide class?

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4. Is $[--CH_2-CH(C_6H_5)--]_n$ a homopolymer or a copolymer ? It is an addition or a condensation polymer ?

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5. Write mechanism of free radical polymerisation of alkenes

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6. In a polymer sample, 30% molecules have molecular mass 20000, 40% have molecular mass 30000 and the rest 30% have 60000. Calculate their number average and mass average molecular masses.

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Evaluate Yourself 1

1. Crystalline solid are

A. It becomes harder

B. It becomes denser

C. It becomes more resistant to heat

D. All of the above

Answer: D

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2. Which of the following properties is/are true for thermoplastics ?

A. The intermolecular forces of attraction are intermediate between elastomers and fibres

B. They have cross-linking between them

C. They cannot be molded by heating

D. All of these

Answer: A

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3. Which is not classified as thermoplastics?

A. Polyethylene

B. Polystyrene

C. Bakelite

D. Neoprene

Answer: C

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4. Which is an exmaple of thermosetting polymer?

A. Bakelite

B. Polyethylene

C. Melmac

D. All of these

Answer: B

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Evaluate Yourself 2

1. Which of the following polymer is an example of fibre ?

A. Silk

B. Dacron

C. Nylon-6,6

D. All of these

Answer: D

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2. Give an example of condensation polymer.

A. Polyethene

B. PVC

C. Orlon

D. Terylene

Answer: D

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3. Which is not a polymer?

A. Sucrose

B. Enzyme

C. Strach

D. Teflon

Answer: A

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4. PVC is preapred by the polymerisation of

A. Ethylene

B. 1-chloropropene

C. Propene

D. 1-chloroethene

Answer: D

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5. Give the stuctures of monomers of the following polymes :

(a) Nylon -6,6 (b) Buna -s

A. Acidic

B. Basic

C. Amphoteric

D. Nuteral

Answer: C

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Check Your Grasp

1. Synthetic polymers are:

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2. The catalyst used for olefin polymerisation is:

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3. Cross linked polymer out of following is :

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4. Differentiate between thermoplastic and thermosetting polymers .

Give one example of each.

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5. Differentiate between rubbers and plastics on the basis of intermolecular forces.

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6. Which are the monomeric repeating units of Nylon-6 and Nylon-6,6 ?

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7. Orlon has monomeric unit:

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C U Q Type Of Polymer

1. A homopolymer is obtained by polymerisation of :

A. One type of monomer units

B. Two types of monomer units

C. Either of these

D. None of these

Answer: A

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2. A copolymer is

A. One type of monomer units

B. More than one type of monomer units

C. Either of these

D. None of these

Answer: B

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3. Thermosetting polymers.

A. Cross-linked polymer

B. Do not melt of soften on heating

C. Cross-linking is usually developed at the time of moulding where they harden reversibly

D. All

Answer: D

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4. What are elastomers ?

A. These are synthetic polymers possessing elasticity

B. These posses very weak intermolecular forces of attraction between polymer chains

C. Vulcanised rubber is an example of elastomer

D. All

Answer: D

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5. To explain the abnormality in some molecules , the conecpt of H-bonding was introduced , Hydrogen bonding is defined as the phenomenon in which H-bonding beteen two molecules is called intermolecular H-bonding between two molecules is called intermolecular H-bonding .Hbonding within a molecule is called

intramolecular H-bonding or within a molecule is called intramolecular H-bonding or chelation .Intermolecular H-bonding favoure for cluster formation whereas intramolecular H-bnding prevents the cluster formation

Which molecule does not show intramolecular H-bonding ?

A. Polarisation

B. Polymerisation

C. Photosensitisation

D. Pasteurisation

Answer: B

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6. Which of the following is not a synthetic polymer?

A. Polyisoprene

B. Polybutadiene

C. Polyethyleneterephtahalate

D. Polyethylene

Answer: A

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7. Formation of nylons and polyesters are called step growth polymerisation because

A. Intermolecule H-bonding

B. van der Waal's attraction

C. Dipole - dipole interaction

D. None of the above

Answer: A

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C U Q Some Important Polymers

1. Terylene is a

A. Polyamide

B. Polyester

C. Polyether

D. Long chain hydrocarbon

Answer: B

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2. Assertion : Buna-S is a copolymer .

Reason : Buna-S is formed by condensation reaction between two

different monomers.

A. Styrene and 1,3-butadiene

B. Styrene and ethylene

C. 1,3-butadiene and ethylene

D. None

Answer: A

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3. Melamine polymer is a copolymer of

A. HCHO and melamine

B. HCHO and ethylene

C. Melamine and ethylene

D. None

Answer: A

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4. STATEMENT-1: Nylon-66 is a polyamide.

STATEMENT-2 : Nylon-66 is a polymer of caprolactam.

STATEMENT-3 : It is a copolymer.

A. Hexamethylene and adipic acid

B. Hexamethylene and sebacic acid

C. Caprolactam

D. None

Answer: B

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5. Assertion : In vulcanisation of rubber , sulphur cross links are introduced.

Reason : Vulcanisation is a free radical intiated chain reaction.

A. Sulphur react of form new compound

B. Sulphur cross-links ar introduced

C. Sulphur forms a very thin protective layer over rubber .

D. All of the statements are correct

Answer: B

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6. The starting material of $PCTFE$is:

A. Monochlorotrifluoroethylene

B. Tetrafluoroethylene

C. Vinyl chloride

D. Styrene

Answer: A

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7. Which one of the following pairs is not correctly matched

A. Terylene - condensation polymer of terephthalic acid and ethylene glycol

B. Teflon-thermally stable cross linked polymer of phenol and formaldehyde

C. Perspex-A homopolymer of methyl methacrylate

D. Synthetic rubber -A copolymer of butadiene and styrene

Answer: B

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8. To what class does nylon -66 belong on the basis of intermolecular force ?

A. H-bonds

B. Covalent bonds

C. van der Waal's attractive forces

D. Ionic bonds

Answer: A

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9. which of the following is not ?

A. Glyptals

B. Bakelite

C. Melamine - formaldehyde polymer

D. Styrene-butadiene rubber

Answer: D

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10. (A)Bakelite is co-polymer.

(R) Bakelite is a thermosetting material.

A. Addition polymer

B. Elastomer

C. Thermoplastic

D. Thermosetting

Answer: D

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11. The monomer unit of PVC is:

A. $Cl_2CH - CH_3$

B. $F_2C = CF_2$

C. $F_3C - CF_3$

D. $FClC = CF_2$

Answer: B

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12. In the following groups of materials, which group/groups contain only non-biodegradable materials ?

(i) wood, paper, leather

(ii) polythene, detergent, PVC

(iii) plastic, detergent, grass

(iv) plastic, bakelite, DDT

A. Filler

B. Antioxidant

C. Stabilizer

D. Plasticiser

Answer: D

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13. Copolymerization of vinyl chloride and vinylidene chloride in a 1 : 4 ratio lead to the formation of a well known polymer called

A. Dynel

B. Saran

C. Vinylon

D. Orlon

Answer: A

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14. Gutta parcha rubber is :

A. A trans 1,4-polyisoprene polymer

B. A very hard material

C. A natural polymer

D. All of these

Answer: D

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15. STATEMENT-1-: Vulcanization introduces S-S crosslinking in rubber and

STATEMENT-2 Vulcanized rubber has low water absorption tendency.

A. Wear and tera due to friction

B. Cryogenic temperature

C. High temperature

D. Action of acids

Answer: A

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16. Chemical name of melamine is:

A. 2,4-diamino-1,3,5-triazine

B. 2-amino-1,3,5-triazine

C. 2,4,6-triamino-1,3,5-triazine

D. 1,3,5-triamino-2,4,6-triazine

Answer: C

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17. A copolymer of isobutylene and isoprene is called :

A. Butyl rubber

B. Buna-S

C. Buna-N

D. Thiokol

Answer: A

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C U Q Biopolymer

1. Which of the following does not cause pollution?

A. Burning of rubber

B. Burning of petrol

C. Use of solar energy

D. Coal

Answer: C

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2. Which of the following is a biodegradable polymer ?

A. Nylon-6,6

B. Nylon-6

C. Nylon-6,10

D. PHBV

Answer: D

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3. Which of the following is not a polymer ?

A. Silk

B. DNA

C. DDT

D. Strach

Answer: C

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Exercise 1 C W Introduction And Classification Of Polymers

1. The repeating structural unit of silicone is

A. Polymer

B. Macromolecule

C. Both 1 & 2

D. None of the above

Answer: B

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2. Which of the following is not a natural polymer?

A. Proteins

B. Polysaccharides

C. Cotton

D. Phenol - formaldehyde resin

Answer: D

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3. Which of the following is a synthetic polymer?

A. Starch

B. Cellulose

C. RNA

D. Terylene

Answer: D

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4. Which of the following is common example of fibres?

A. Rubber

B. Nylon-6,6

C. PVC

D. Bakellite

Answer: B

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5. Which of the following is an example of thermoplastic polymer?

A. Bakellite

B. Polysiloxanes

C. PE

D. All

Answer: C

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6. Natural polymer among the following is :

A. Rayon

B. Nylon-6

C. Dacron

D. Proteins

Answer: D

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7. Which one of the following is an example of thermosetting polymer ?

A. Sealing Wax

B. Nylon-6,6

C. PVC

D. Bakelite

Answer: D

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8. Which of the following is natural polymer ?

A. Bakellite

B. terylene

C. egg albumin

D. Nylon

Answer: C

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Exercise 1 C W Polymerization Process

1. Which one of the following is a chain growth polymer?

A. Nylon

B. Bakelite

C. Terylene

D. Teflon

Answer: D

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2. Which among the following is step growth polymer ?

A. PTFE

B. PVC

C. Polyester

D. Polythene

Answer: C

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3. Nylon 6,6 is obained by condensation polymerisation of

A. Adipic acid and hexamethylene diamine

B. Phenol and formaldehyde

C. Terephthalic acid and ethylene glycol

D. Scbacic acid and hexamethylene

Answer: A

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4. which of the following is an examle of additional ploymerization ?

A. Proteins

B. Teflon

C. Nylon-6,6

D. Glyptal

Answer: B

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5. Which of the following statements are correct about Nylon-6, 6?

A. Electro Static forces of attraction

B. Hydrogen bonding

C. Three dimensional network of bonds

D. Metallic bonding

Answer: B

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6. Branching of hydrocaron chains results in

A. Free radical

B. Cationic

C. Anionic

D. Anionic and Ziegler - Natta

Answer: B

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7. The polymerization process in which two or more chemically different monomers take part to form a polymer is called

A. Addition polymerization

B. Copolymerization

C. Chain polymerization

D. Homopolymerization

Answer: B

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8. Terylene is a :

A. An addition polymer with a benzene ring in every repeating unit

B. A condensation polymer with a benzene ring in every repeating uint

C. An addition polymer with two carbon atoms in every repeating uint

D. A condensation polymer with two nitrogen atoms in every repeating unit

Answer: B

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9. Which of the following has ester linkage ?

A. Nylon-6,6

B. Dacron

C. PVC

D. Bakelite

Answer: B

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10. Which of the following type of linkage present in PHBV ?

A. amide

B. Ester

C. diene

D. nitrile

Answer: B

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11. Which of the following is not a polyamide?

A. wool

B. leather

C. Nylon

D. Natural rubber

Answer: D

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12. Polymerization of iso butene is mostly

A. a cation

B. an anion

C. a free radical

D. a zwitter ion

Answer: A

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13. Which of the following are not polymeric

A. Cation polymerization

B. Anionic polymerization

C. Free radical polymerization

D. Condensation polymerization

Answer: D

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14. The catalyst used for the polymerization of olefins is:

A. Ziegler natta catalyst

B. Wiklinson's catalyst

C. pd-catalyst

D. Zeise's salt catalyst

Answer: A

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15. Which of the following monomers has greatest ability to undergo cationic polymerisation?

A. Vinyl monomers with electron donating group

B. Vinyl monomers with electron withdrawing group

C. poly functional group monomers

D. Saturated hydrocarbons

Answer: A

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Exercise 1 C W Natural Synthetic Rubber

1. Natural Rubber

A. Weakest intermolecular forces

B. Hydrogen bonding

C. Three dimensional network of bonds

D. Metallic bonding

Answer: A

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2. Assertion : 1, 3-Butadiene is the monomer of natural rubber

Reason : In natural rubber, the monomers are linked by cationic polymerisation

A. Butadiene

B. Chloreprene

C. Isoprene

D. Butadiene and Styrene

Answer: C

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3. The process involving heating of rubber with sulphur is called:

A. Galvanisation

B. Vulcanization

C. Bessemerisation

D. Sulphonation

Answer: B

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4. The range of an ammeter of resistance G can be increased from I to nI by connecting,

A. Galvanisation

B. Vulcanization

C. Bessemerisation

D. Sulphonation

Answer: B

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5. Assertion : In vulcanisation of rubber , sulphur cross links are introduced.

Reason : Vulcanisation is a free radical intiated chain reaction.

A. $-S-S-$

B. $S=0$

C. $H-\overset{|}{\underset{|}{S}}-H$.....

D. Hydrogen

Answer: A

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6. Ebonite is:

A. Natural rubber

B. synthetic rubber

C. higly vulcanised rubber

D. poly propene

Answer: C

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7. What is the role of dosorption in the process of catalysis ?

A. to accelerate the process

B. to slow down the process

C. to stop the process

D. to initiate the process

Answer: A

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8. Empirical and Molecular Formula

A. C_2H_8, C_5H_8

B. $C_5H_8, (C_5H_8)_n$

C. $C_4H_8, (C_4H_6)_n$

D. $C_5H_{12}, (C_5H_8)_n$

Answer: B

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9. Synthetic polymer which resembler natural rubber is:

A. Neoprene

B. Buna-S

C. Nylon

D. Rayon

Answer: A

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10. Buna-S is a polymer of :

A. Styrene and 1,3-butadiene

B. Styrene and ethylene

C. 1,3- butadiene and ethylene

D. 1,3- butandiene and acrylonitirle

Answer: A

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Exercise 1 C W Determination Of Molecular Weights Of Polymers

1. The number average molecular mass and mass average molecular mass of a polymer are respectively 30,000 and 40,000. The poly dispersity of the polymer is:

A. < 1

B. > 1

C. 1

D. 0

Answer: B

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2. What is the polydispersity index of polymer if the mass average molecular mass & number average molecular mass of a polymer are

respectively 40,000 and 30,000 ?

A. 10000

B. 20800

C. 25000

D. 30600

Answer: B

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3. If N_1, N_2, N_3.....Are the number of molecules with molecular masses M_1, M_2, M_3.....respectively, then average molecular mass is expressed as

A. $\frac{\sum N_i M_i^2}{\sum N_i M_i}$

B. $\frac{\sum N_i M_i}{\sum N_i}$

C. $\frac{\sum M_i^2}{\sum N_i}$

D. $\frac{\sum N_i M_i}{\sum M_i}$

Answer: A

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4. Relation belween number of average molecular mass $\left(\overline{M}_n\right)$ and weight of average molecular mass $\left(\overline{M}_w\right)$ of synthetid polymers is

A. $\overline{M_n} < \overline{M_w}$

B. $\overline{M_n} > \overline{M_w}$

C. $\overline{M_n} = \overline{M_w}$

D. $\overline{M_n} = \sqrt{\overline{M_w}}$

Answer: A

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Exercise 1 C W Bio Polymers Bio Degradable Polymers

1. The monomers of biodegradable polymer , nylon 2-nylon 6 are

A. acrylonitrile

B. amino caproic acid

C. alanine

D. adipic acid

Answer: B

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2. Which of the following is the monomer of insulin ?

A. β-hydroxy butanoic acid

B. α-hydroxy butanoic acid

C. β-hydroxy pentanoic acid

D. α-hydroxy pentanoic acid

Answer: C

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3. Blood plasma is

A. Cellulose

B. Teflon

C. Bakelite

D. Polyvinyl pyrrolidone

Answer: D

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4. Which one of the following sets forms the biodegrable polymer?

A. Dextrose

B. Dextrine

C. Dextron

D. Dacron

Answer: C

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Exercise 1 C W Commercially Important Polymers

1. Aniline reacts with benzoy1 chloride in the presence of dilute Na OH to give .

A. Bakellite

B. Polyethylene

C. Dacron

D. Nylon-6,6

Answer: A

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2. Which of the following is used in making textile and ropes

A. Dacron

B. Perlon-L

C. Rayon

D. Both 1 & 3

Answer: B

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3. Which of the following is used in tyre cords ?

A. Nylon-6

B. Silicone polymers

C. Plexi glass

D. All

Answer: A

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4. Which of the following is a free radical substitution reaction?

A. Glyptals

B. Urea formaldehyde resin

C. PMMA

D. All

Answer: C

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5. Which of the following is a poor conductor of enectricity

A. Polyethene

B. Polystyrene

C. PVC

D. All

Answer: B

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6. Which of the following are aprotc solvents:

A. Nitrile rubber

B. Buna-N

C. GRN

D. Any one

Answer: D

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7. Which of the following has largest resistance ?

A. Nylon -6

B. Perlon-L

C. Dacron

D. Both 1 & 2

Answer: D

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8. In which of the following colloidal solution dispersed phase is liquid while dispersion medium is gas?

A. Artificial silk

B. Bakelite

C. Silicone polymers

D. All

Answer: C

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1. Which of the following is a synthetic polymer?

A. Cellulose rayon

B. Acrylonitrile

C. Cellulose nitrate

D. Both 1 & 3

Answer: D

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2. Natural polymer among the following is :

A. Melamine

B. Starch

C. Bakelite

D. Polyvinylchloride

Answer: D

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3. Which of the following has a branched chain structure?

A. LDPE

B. Nylon

C. Phenol formaldehyde resin

D. Terylene

Answer: A

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4. Cross linked polymer out of following is :

A. Polythene

B. LDPE

C. Melamine formaldehyde resin

D. Nylon 6,6

Answer: C

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5. Explain the following terms :

(a) Homopolymers

(b) Elastomers

A. Buna-N

B. Buna-S

C. Neoprene

D. All

Answer: D

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6. Natural polymer among the following is :

A. Rayon

B. Starch

C. Silicone rubber

D. Natural rubber

Answer: C

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7. Among the following the weakest base is .

A. Thermosetting polymers

B. Thermoplastic polymers

C. Fibres

D. Elastomers

Answer: D

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Exercise 1 H W Polymerisation Process

1. Which of the following is an example of co-polymer?

A. PTFE

B. Perlon-L

C. Neoprene

D. PET

Answer: D

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2. Melmac is a condensation polymer of melamine and formaldehyde.

How many nitrogen atoms are present in the melamine monomer?

A. Formaldehyde

B. Phenol

C. Melamine

D. Ethylene glycol

Answer: B

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3. Which polymer among the following does not soften on heating ?

A. Bakelite

B. Polysiloxane

C. Urea formaldehyde resin

D. PVC

Answer: D

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4. Low density polythene is prepared by

A. Free radical polymerization

B. Cationic polymerization

C. Anionic polymerization

D. Ziegler-Natta polymerization

Answer: A

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5. Which of the following is incorrect?

A. Polythethylene contains double bonds

B. The monomer used to make teflon is C_2F_4

C. Condensation polymers are also known as step growth polymers

D. A denatured protein could have the same primary structure as the active protein

Answer: A

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6. The catalyst used for olefin polymerization is:

A. Ziegler natta catalyst

B. Wiklinson's catalyst

C. Raney nickel catalyst

D. Merrrified resin

Answer: A

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Exercise 1 H W Natural Syntehtic Rubber

1. Which percentage of sulphur is used in the vulcanization of rubber?

A. $5\ \%$

B. $3\ \%$

C. $30\ \%$

D. $55\ \%$

Answer: A

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2. Which of the following are example of synthetic rubber?

A. Butadiene

B. Chloreprene

C. 2-Methyl-1,2-butadiene

D. 2-Methyl-1,3-butandiene

Answer: B

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3. Rubber latex is which type of emulsion

A. oil in oil

B. water in oil

C. oil in water

D. solid in water

Answer: C

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4. Catalytic hydrogenation of natural rubber gives

A. syn diotactic product

B. atactic product

C. isotactic product

D. None of these

Answer: B

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5. In vulcanization of rubber:

A. Temperature of vulcanization

B. Time of vulcanization

C. Amount of sulphur

D. All of these

Answer: C

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6. Which of the following is synthetic rubber?

A. Thiokol

B. SBR

C. Polyurethane

D. All of these

Answer: D

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Exercise 1 H W Determination Of Molecular Weights Of Polymers

1. Select the incorrect statement

A. for natural polymers , PDI is generally 1

B. for natural polymers are more homogenous than synthetic polymers

C. for synthetic polymers PDI is generally 1

D. the polymers whose molecules have nearly same molecular mass , PDI is 1

Answer: C

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2. In a polymer sample, 30% of molecules have a molecualr mass of $20,000$, 40% have 30,000 and the rest 60,000. What is the weight average molecular mass of the polymer?

A. 40300

B. 30600

C. 43333

D. 33353

Answer: C

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3. The abbreviation PDI refers to :

A. poly density index

B. poly dispersity index

C. planck's disposal index

D. poly diagonal index

Answer: B

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4. Statement 1:PDI(polydispersity index)of natural polymer is unity,while that of syntheric polymer is greater than unity

Statement 2:Natural polymers are hemogeneous.

A. zero

B. 100

C. 1

D. 10

Answer: C

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Exercise 1 H W Bio Polymers Bio Degradable Polymers

1. Drugs which are to be released in a controlled manner in the body are enclosed in capsules made of the following polymer

A. PGA

B. PCL

C. PHBV

D. None of these

Answer: C

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2. A polymer containing nitrogen is

A. Terylene

B. Polythene

C. PVC

D. Nylon

Answer: D

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3. The polymer used in making handles of cookers and frying pans is

A. Poly glycolic acid

B. Poly lactic acid

C. Nylon-2-Nylon-6

D. PHBV

Answer: D

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Exercise 1 H W Commercially Important Polymers

1. The monomer of the polymer which is used as a substitute for wool is

A. styrene

B. tetrafluoroethene

C. chloroethene

D. prop-2-enenitrile

Answer: D

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2. Assertion (A) Polytetrafluorothene is used in making non stick cookwares.

Reason (R) Fluorine has highest electronegativity.

A. SBR

B. Teflon

C. PVC

D. Poly ethyl acrylate

Answer: B

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3. Nylon threads are made up of:

A. Polyethylene polymer

B. Polyvinyl polymer

C. Polyester polymer

D. Polyamide polymer

Answer: D

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4. Which one of the following cannot be considered as use of ether?

A. C_2H_4

B. C_2H_2

C. C_2H_6

D. C_4H_6

Answer: C

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Exercise 2 C W Polymerisation Process

1. Which of the following structures represents neoprene polymer?

A. $\left[-\overset{\overset{O}{||}}{C} - NH - (CH_2)_5 - \right]_n$

B. $\left(-OCH_2 - CH_2 - O - \overset{\overset{O}{||}}{C} - C_6H_4 - \overset{\overset{O}{||}}{C} - \right)_n$

C. $\left(-CH_2\_CH = CH - CH_2 - \underset{\underset{O}{||}}{C} - CH_2 - \right)_n$

D. $(-CH_2 - CH = CH - CH_2 -)_n$

Answer: B

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2. Which one of the following structures represents nylon-6,6 polymer?

A. $\left(-C\overset{\overset{O}{||}}{C} - NH - (CH_2)_5 - \right)_n$

B. $\left(-OCH_2 - CH_2 - O - \overset{\overset{O}{||}}{C} - C_6H_4 - \overset{\overset{O}{||}}{C} - \right)_n$

C. $\left(-NH-(CH_2)_6-NH-CO-(CH_2)_4-CO- \right)_n$

D. $\left(-CH_2-CH=CH-CH_2-CH-CH_2-C_6H_5 \right)_n$

Answer: C

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3. $CH_2=CH-CH_2-NH-CH_3$ is a

A. $III < II < I$

B. $I < II < III$

C. $III < I < II$

D. $II < I < III$

Answer: C

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4. FREE RADICAL

A. $CH_3 - CH = CH_2$

B. $CH_3 - \underset{\underset{CH_3}{|}}{C} = CH_2$

C. $CH_2 = \underset{\underset{CN}{|}}{C\,H}$

D. $C_6H_5 - CH = CH_2$

Answer: D

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Exercise 2 C W Natural Synthetic Rubber

1. Natural Rubber

A. 4-oxopentanal

B. 3-oxopentanal

C. Hexane-2,5-diene

D. Pentanedial

Answer: A

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2. Write the names and structures of the monomers of the following polymers:

(i) Buna-S (ii) Neoprene (iii) Nylon-6, 6

A. Bu' stands for 1,3-butadiene

B. Na' stand for Sodium (catalyst)

C. S' stands for styrene

D. It is used in manufacture of hoses (Flexible pipe)

Answer: D

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3. Natural rubber is

A. Polydiync

B. Polyamide

C. Polyester

D. Polydiene

Answer: D

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Exercise 2 C W Commercial Polymers

1. Synthetic human hair wigs are made from a copolymer of vinyl chloride and acrylonitrile, and is called:

A. PVC

B. Dynel

C. Polyacrylonitrile

D. Cellulose

Answer: B

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2. Plexiglass (PMMA) is a polymer of

A. Acrylic acid

B. Methaylacrylate

C. Methylmethacrylate

D. Methylpropacrylate

Answer: C

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Exercise 2 H W Introduction And Classification

1. Which of the following polymers are condensation polymes?

A. Linear

B. Cross-linked

C. Branched - chain

D. Thermoplastic

Answer: B

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2. Thermoplastics are the polymers

A. Linear polymers

B. soften or melt on heating

C. molten polymer can be moulded in desired shape

D. all the correct

Answer: D

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3. Thermosetting polymers.

A. Cross-linked polymer

B. Do not melt of soften on heating

C. cross-linking occurs during heating when it hardens irreversibly

D. all the correct

Answer: D

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Exercise 2 H W Polymerisation Process

1. EA_1 values of the following elements has positive value

(I) Be (II) Br (III) Mg (IV) Cl

The correct answer is

A. All are correct

B. only 1

C. only 2 and 3

D. only 1 and 4

Answer: C

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2. Give reasons

(a) Platinum, gold and silver are used to make jewellery.

(b) Sodium, potassium and lithium are stored under oil.

(c) Aluminium is a highly reactive metal, yet it is used to make utensils for cooking.

(d) Carbonate and sulphide ores are usually converted into oxides during the process of extraction.

A. only a

B. only a and b

C. only c and d

D. all

Answer: B

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3. What is the role of benzoyl peroxide in the polymerisation of ethene ?

A. Cationic

B. Anionic

C. Free-radical

D. None of these

Answer: C

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4. Name a substance which inhibits free radical polymerisation.

A. four

B. three

C. two

D. one

Answer: B

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5. Number of nitrogen atoms present in melamine is x. The number of-imine and - amine groups is y and z,x,y and z are respectively

A. 3,1,2

B. 6,1,3

C. 6,3,3

D. 6,3,1

Answer: C

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6. Which of the following alkenes is most reactive towards cationic polymerization?

A. $CH_2 = CHCH_3$

B. $H_2C = CHCl$

C. $H_2C = CH_6H_5$

D. $H_2C = CHCO_2CH_3$

Answer: C

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7. Which of the following statements is not ture?

A. prepared by Ziegler - Natta polymerization

B. is a thermoplastic

C. is a transparent

D. has linear structure

Answer: C

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8. Given th polymers,

$A =$ Nylon-6,6, $B =$ Buna-S, $C =$ Polythene

Arrange these in decreasing order of their intermolecular forces:

A. $A > B > C$

B. $B > C > A$

C. $B < C < A$

D. $C < A < B$

Answer: C

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Exercise 2 H W Natural Synthetic Rubber

1. In which of the following polymers , empirical formula resembles with monomer ?

A. Teflon

B. Nylon-6,6

C. Dacron

D. Bakelite

Answer: A

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2. Natural rubber is a polymer of

A. $CH_2 = CH - CH = CH_2$

B. $CH_2 = CH - \overset{\overset{CH_3}{|}}{C} = CH_2$

C. $CH_2 = \overset{\overset{CH_3}{|}}{C} - \overset{\overset{CH_3}{|}}{C} = CH_2$

D. $CH_2 = CH - CH_2 - CH_2$

Answer: B

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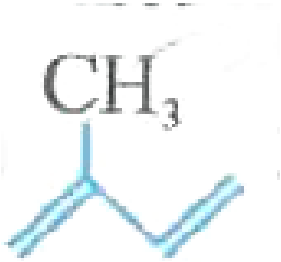
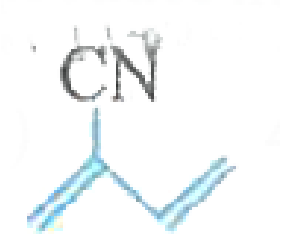
3. Which one of the following monomers gives the polymer neoprene on polymerization?

A. 

B. 

C. 

D. 

Answer: A

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Exercise 2 H W Commercially Important Polymers

1. The polymer used in the manufacture of squeeze bottles is:

A. Polythene

B. Bakelite

C. Neoprene

D. PHBV

Answer: B

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2. When steam is passed through red hot coke:

A. sp^3, sp^2

B. sp, sp^2

C. sp, sp^3d

D. sp^2, sp

Answer: B

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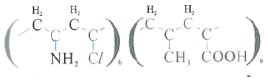
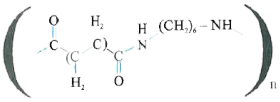
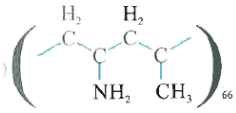
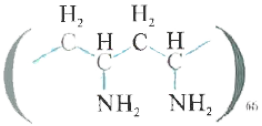
Exercise 3

1. Which one of the following structures represents nylon-6,6 polymer?

A. 

B. 

C. 

D. 

Answer: B

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2. Caprolactam, is used for the manufacture of

A. Terylene

B. Nylon-6,6

C. Nylon-6

D. Teflon

Answer: C

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3. Biodegradable polymer which can be produced from glycine and aminocaproic acid.

A. Buna-N

B. Nylon-6,6

C. Nylon 2-nylon 6

D. PHBV

Answer: C

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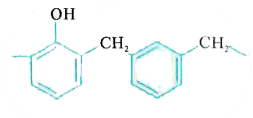
4. Which one of the following is an example of a thermosetting polymer?

A. 

B. $\left(-CH_2 - \underset{\underset{Cl}{|}}{C} = CH - CH_2 \right)_n$

C. $\left(-CH_2 - \underset{\underset{Cl}{|}}{CH} - \right)_n$

D. $\left(-\overset{\overset{H}{|}}{N} - (CH_2)_6 - \overset{\overset{H}{|}}{N} - \overset{\overset{O}{|}}{C} - (CH_2)_4 - \overset{\overset{O}{||}}{C} - \right)_n$

Answer: A

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5. When $22.4L$ of $H_2(g)$ is mixed with 11.2 of $Cl_2(g)$, each at STP, the moles of HCl(g) formed is equal to

A. 1.5 mol of HCl (g)

B. 1 mol of HCl (g)

C. 2 mol of HCl (g)

D. 0.5 mol of HCl (g)

Answer: B

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6. Which is the monomer of neoprene in the following?

A. $CH_2 = \underset{\underset{CH_3}{|}}{C} - CH = CH$

B. $CH_2 - \underset{\underset{Cl}{|}}{C} - CH = CH$

C. $CH_2 = CH - C = CH$

D. $CH_2 = CH - CH = CH_2$

Answer: B

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7. Nylon is an example of:

A. Polysaccharide

B. Polyamide

C. Polythene

D. Polyester

Answer: B

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8. Which of the following statements is false ?

A. Artificial silk is a derived from cellulose

B. Nylon-66 is an example of elastomer

C. The repeat unit in natural rubber is isoprene

D. Both starch and cellulose are polymer of glucose

Answer: B

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9. Which one of the following is not a condensation polymer?

A. Melamine

B. Glyptal

C. Dacron

D. Neoprene

Answer: D

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10. Which one of the following sets forms biodegradable polymer?

A. $CH_2 = CH - CN \& CH_2 = CH - CH - CH_2$

B. $H_2N - CH_2 - COOH \& H_2N - (CH_2)_5 - COOH$

C. 

D. 

Answer: B

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11. Of the following which one is classified as polyester polymer ?

A. Nylon-66

B. terylene

C. Bakelite

D. Melamine

Answer: B

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12. Buna-S is a polymer of :

A. Butadiene only

B. Butadiene and styrene

C. Styrene only

D. Butadiene and nitryl

Answer: B

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13. Match the following correctly

	Catalyst		Industrial Product
A	V_2O_5	1	High density polythylene
B	Ziegler - Natta	2	Polyacrylonitrile
C	Peroxide	3	NH_3
D	Finely divided Fe	4	H_2SO_4

A. $\begin{matrix} A & B & C & D \\ 4 & 1 & 2 & 3 \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ 4 & 3 & 2 & 1 \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ 3 & 1 & 2 & 4 \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ 4 & 1 & 3 & 2 \end{matrix}$

Answer: A

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14. The monomers used for the synthesis of nylon-2-nylon-6 are :

A. Caprolactam

B. Alanine and amino caproic acid

C. Glycine and amino caproic acid

D. Glycine and amino valeric acid

Answer: C

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15. Terylene is a :

A. Polyamide

B. Polyester

C. Polyethylene

D. Polypropylene

Answer: B

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16. Natural rubber is which type of polymer?

A. Neoprene

B. Isoprene

C. Chloroprene

D. Butadiene

Answer: B

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17. Terylene is made by polymerization of terephthalic acid with:

A. nylon

B. buna rubber

C. Polyurethane

D. terylene

Answer: D

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18. Arrange the following polymers in increasing order of their intermolecular forces :

(i) Nylon 6, 6, Buna-S, Polythene.

(ii) Nylon 6, Neoprene, Polyvinyl chloride.

A. II,I,III

B. III,II,I

C. I,II,III

D. II,III,I

Answer: C

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19. A polymer is resistant to heat and chemical attack and is also used for coating articles and cookwares to make them non - sticky. The monomer of this polymer is

A. PET

B. PAN

C. Teflon

D. Perlon

Answer: C

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20. Neoprene is a polymer of

A. a monomer of rubber

B. synthetic rubber

C. natural rubber

D. Vulcanised rubber

Answer: B

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21. Which of the following structures represents neoprene polymers?

A. $\left(-CH_2 - \underset{C_6H_5}{C}H - \right)$

B. $\left(-CH_2 - \underset{Cl}{C} = CH - CH_2 - \right)_n$

C. $\left(-CH_2-\overset{CN}{\overset{|}{C}}H- \right)_n$

D. $\left(-CH_2-\overset{Cl}{\overset{|}{C}}H- \right)_n$

Answer: C

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22. Which polymers occur naturally?

A. Strach and nylon

B. Strach and cellulose

C. Proteins and nylon

D. Proteins and PVC

Answer: B

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23. The straight chain polymer is formed by

A. Hydrolysis of $(CH_3)_3SiCl$ followed by condensation polymerisation

B. Hydrolysis of CH_3SiCl_3 followed by condensation polymerisation

C. Hydrolysis of $(CH_3)_4Si$ by addition polymerisation

D. Hydrolysis of $(CH_3)_2SiCl_2$ followed by condensation polymerisation

Answer: D

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24. Which of the following polymers is prepared by condensation polymerisation?

A. Nylon-6,6

B. Nylon-6,10

C. Nylon-6

D. Nylon-11

Answer: C

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25. Which is an exmaple of thermosetting polymer?

A. Polythene

B. PVC

C. Neoprene

D. Bakelite

Answer: D

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26. Assertion : Natural rubber is vulcansied through cross-linking

Reason : Vulcanisation of natural rubber is done with the help of molten sulphur

A. 3% S

B. 7% S

C. 1% S

D. All of the above can be used

Answer: B

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27. Struchures of some common polymers are given. Which one is not correctly represented?

A. Teflon $(CF_2 - CF_2 -)_n$

B. Neoprene $\left(- CH_2 - \underset{Cl}{\overset{|}{C}} = CH - CH_2 - CH_2 - \right)_n$

C. 

D. Nylon 66 $\left(- \ - NH(CH_2)_6 NHCO(CH_2)_4 - CO_2 - \right)$

Answer: B

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28. Nylon-6,6 is a

A. polyamide

B. polyester

C. polystyrene

D. polyvinyl

Answer: A

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29. A polymer containing nitrogen is

A. Polyvinyl chloride

B. Bakelite

C. Nylon

D. Terylene

Answer: C

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30. Three dimensional molecules with cross-links are formed in case of

A. Thermoplastic

B. thermosetting plastic

C. Both (1) and (2)

D. None of these

Answer: B

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31. Plexsi glass is a commercial name of

A. glyptal

B. polyacrylonitrile

C. polymethyl methacrylate

D. polyethyl acrylate

Answer: C

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32. Which one of the following polymers is prepared by condensation polymerization?

A. Nylon-66

B. Teflon

C. Rubber

D. Styren

Answer: A

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33. Glycogen , a naturally occurring polymer stored in animals is a

A. Polythene

B. PVC

C. Acetic acid

D. Protein

Answer: D

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34. (i) Identify aliphatic biodegradable polymer which is used in packing and in orthopedic devices

(ii) Write its full form

(iii) Give the structures of the monomers from which it is formed ?

(iv) Show the formation of the polymer

A. Teflon

B. Terylene

C. Polystyrene

D. Polyethene

Answer: A

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Exercise 4

1. Which of the following polymers of glucose is stored by animals?

A. Cellulose

B. Amylose

C. Amylopectin

D. Glycogen

Answer: D

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2. Which of the following is not semisynthetic polymer?

A. Cis - polyisoprene

B. Cellulose nitrate

C. Cellulose acetate

D. Vulcanised rubber

Answer: A

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3. The commercial name of polyacrylonitrile is

A. Dacron

B. Orlon

C. PVC

D. Bakelite

Answer: B

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4. Which of the following polymers is biodegradable ?

A. $\left(-CH_2 - \underset{Cl}{\overset{|}{C}} = CH - CH_2 - \right)$

B. $\left(-CH_2 - CH = CH - CH_2 - CH_2 - \overset{CN}{\overset{|}{C}}H - \right)_n$

C.

$$\left(-O - \underset{CH_3}{\overset{|}{C}}H - CH_2 - \underset{O}{\overset{||}{C}} - O - \underset{CH_2CH_3}{\overset{|}{C}}H - CH_2 - \underset{O}{\overset{||}{C}} - \right)_n$$

D. $\left(-\overset{H}{\overset{|}{N}}N-(CH_2)_6-\overset{H}{\overset{|}{N}}-\overset{O}{\overset{||}{C}}-(CH_2)_4-\overset{O}{\overset{||}{C}}- \right)_n$

Answer: D

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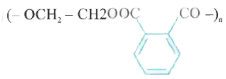
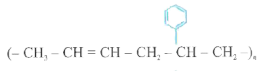
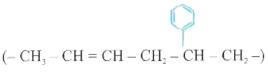
5. In which of the following polymers ethylene glycol is one of the monomer units ?

A. 

B. 

C. 

D. $\left(-O-\underset{CH_3}{\overset{|}{C}}H-CH_2-\overset{O}{\overset{||}{C}}-O-\underset{CH_2CH_3}{\overset{|}{C}}H-CH_2-\overset{O}{\overset{||}{C}}- \right)_n$

Answer: A

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6. Which of the following statements is not true about low density polythene ?

A. Tough

B. Hard

C. Poor conductor of electricity

D. Highly branched structure

Answer: C

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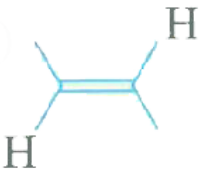
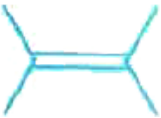
7. IUPAC nomenclature of

$$CH_3 - \underset{\underset{CH_2-CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH = \underset{|}{\overset{\overset{CH_3}{|}}{C}} - CH_3$$ is

A. 

B. 

C. 

D. 

Answer: A

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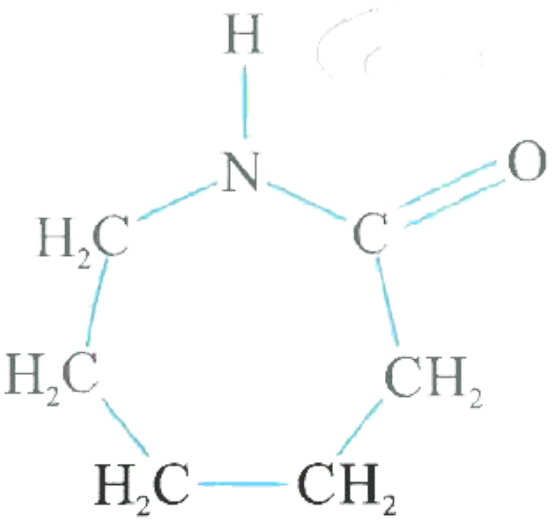
8. Which of the following polymer can be formed by using the following monomer unit ?



A. Nylon-6,6

B. Nylon 2-nylon-6

C. Melamine polymer

D. Nylone-6

Answer: D

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