CHEMISTRY

BOOKS - MODERN PUBLISHERS CHEMISTRY (HINGLISH)

POLYMERS

Solved Examples

1. Is $(NH - CHR - CO)_n$ a homopolymer or copolymer?

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2. How does the presence of benzoquinone inhibit the free radical polymerisation of a vinyl derivative?

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3. 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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4. (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

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Practice Problems

1. Arrange the following polymers in increasing order of intermolecular forces. Also calssify them as addition and condensation polymers :

Nylon - 6, neoprene, PVC.

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2. Classify the following polymers as chain growth and step growth polymers :

(i) Buna - S (ii) Nylon - 6, 6 (iii) Terylene (iv) PVC.

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3. Fill in the blanks :

	Monomers	Polymers	One important use
(i)	.....	Glyptal	.....
(ii)	.....	.....	for making crockery
(iii)	Adipic acid hexamethylene diamine	.....	.....
(iv)	.....	.....	for making switches and plugs
(v)	.....	PMAA	.....

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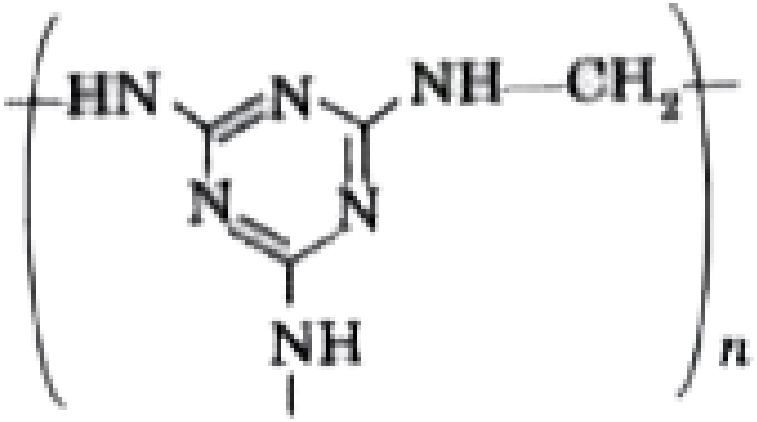
Conceptual Questions

1. Write the monomers of the following polymer?



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2. What is the primary structural feature necessary for a molecule to make it useful in a condensation polymerisation reaction ?

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3. What are cross - linked polymers? Give one example of this type.

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4. What is the difference between two notations : nylon - 6 and nylon - 66 ?

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5. Classify the following as addition and condensation polymers : Terylene, Bakelite, polyvinyl chloride, polythene.

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6. Name one polymer formed by step growth polymerisation. Give names of its monomers.

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7. What is the trade name of polyacrylonitrile?

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8. How will you distinguish thermoplastic polymers and thermosetting polymers?

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9. Arrange the following polymers in an increasing order of intermolecular forces , fibre, plastic , elastomer .

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10. What is the function of S in the vulcanization of rubber ?

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

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12. Which is not a polyacrylate ?

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13. Write the structure of a reagent used for initiating a free radical chain reactions. How does it act ?

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14. Write the monomers and chemical equation for the preparation of Buna - S rubber.

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15. On the basic of forces between their molecules in a polymer to which class does nylon-6, 6 belong?

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16. (a) Give an example of a synthetic rubber and mention its main advantage.

(b) Write the structure of the monomers of Dacron

(c) Arrange the given polymers in the increasing order of tensile strength Nylon-6, Buna-S, Polythene

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17. Is $\left(-CH_2 - \underset{Cl}{\underset{|}{CH}} \right)_n$ a homopolymer or copolymer ?

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Ncert File Ncert In Text Question

1. What are polymers ?

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2. How are polymers classified on the basis of structure ?

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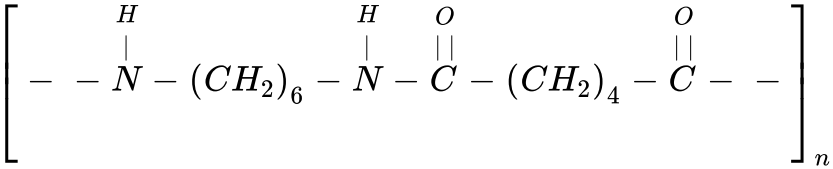
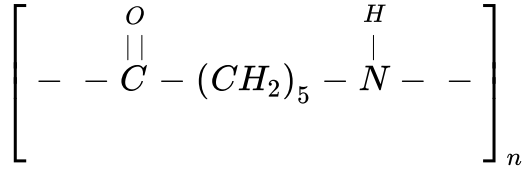
3. Write the names of monomers of the following polymers.

(i) 

(ii) 

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4. Classify the following as addition and condensation polymers : Terylene, Bakelite, polyvinyl chloride, polythene.

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5. What is the difference between Buna-N and Buna-S.

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

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

(ii) Nylon 6, Neoprene, Polyvinyl chloride.

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Ncert File Ncert Textbook Exercises

1. Explain the terms polymer and monomer.

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2. What are natural and synthetic polymers ? Give two examples of each type.

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3. Distinguish between the terms homopolymer and copolymer and give an example of each.

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4. How do you explain the functionality of a monomer?

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5. Define the term polymersation.

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6. Is $(NH-CHR-CO)_n$ a homopolymer or copolymer?

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7. In which classes, the polymers are classified on the basis of molecular forces ?

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8. How can you differentiate between addition and condensation polymerisation ?

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9. Explain the term copolymersation and give two examples.

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10. Write the free radical mechanism for the polymersation of ethene.

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11. Define thermoplastics and thermosetting polymers with two examples of each.

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12. Write the monomers used for getting the following polymers.

(i)Polyvinyl chloride (ii)Teflon(iii)Bakelite

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13. Write the name and structure of one of the common initiators used in free radical addition polymersations.

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14. How does the presence of double bonds in rubber molecules influence their structure and reactivity?

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15. Discuss the main purpose of vulcanisation of rubber.

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16. What are monomeric repeating units of nylon-6and nylon-6.6?

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

(i)Buna-S,(ii)Buna-N

(iii)Dacron,(iv)Neoprene

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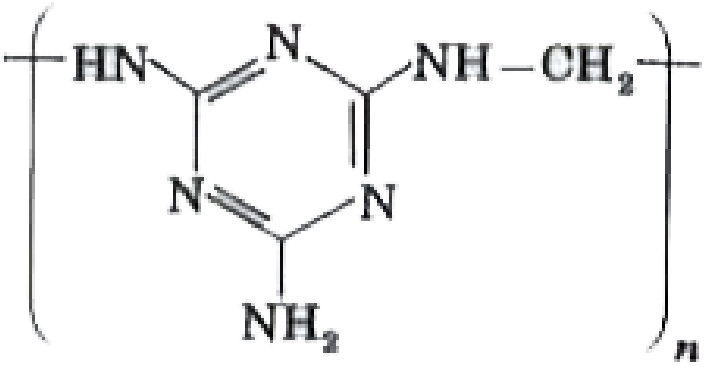
18. Identify the monomer in the following polymer structure:

(i) $\left[- - \overset{O}{\overset{||}{C}} - (CH_2)_8 - \overset{O}{\overset{||}{C}} - NH - (CH_2)_6 - NH - - \right]_n$

(ii)



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19. How is Dacron obtained from ethylene glycol and terephthalic acid?

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20. What is a biodegradable polymer ? Give an example of a biodegradable aliphatic polyester.

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Ncert Exemplar Problems Multiple Choice Questions Type I

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

A. Cellulose

B. Amylose

C. Amylopectin

D. Glycogen

Answer: D

2. Which of the following is not semisynthetic polymer?

A. cis - polyisoprene

B. Cellulose nitrate

C. Cellulose acetate

D. Vulcanised rubber

Answer: A

3. The commercial name of polyacrylonitrile is

A. Dacron

B. Orlon (acrilan)

C. PVC

D. Bakelite

Answer: B

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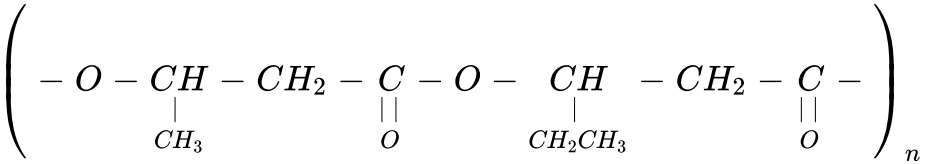
4. Which of the following polymers is biodegradable ?

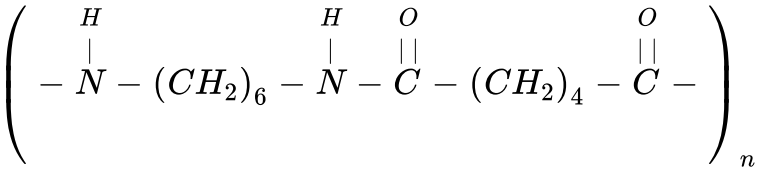
A. $\left(-CH_2 - \underset{Cl}{\underset{|}{C}} = CH - CH_2 - \right)_n$

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

C.



D.



Answer: C

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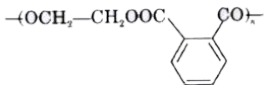
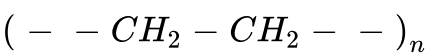
5. In which of the following polymers ethylene glycol is one of the monomer units ?

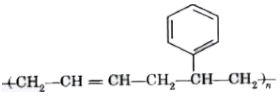
A.



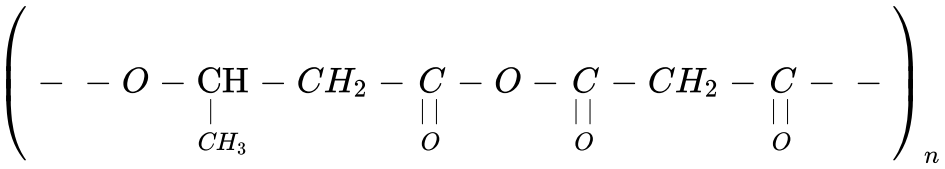
B.



C.



D.



Answer: A

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

A. Tough

B. Hard

C. Good conductor of electricity

D. Highly branched structure

Answer: C

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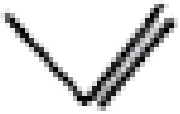
7. $\left(- - CH_2 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_2 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - - \right)_n$ is a polymer having monomer units _____.

A. 

B. 

C. 

D. 

Answer: A

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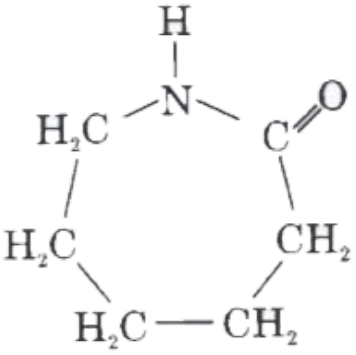
8. Which of the following polymer can be formed by using the following monomer unit?



A. Nylon 6, 6

B. Nylon 2 - Nylon 6

C. Melamine polymer

D. Nylon - 6

Answer: D

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Ncert Exemplar Problems Multiple Choice Questions Type Ii

1. Which of the following polymers, need atleast one diene monomer for their preparation?

A. Dacron

B. Buna-S

C. Neoprene

D. Novolac

Answer: B::C

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2. Which of the following characteristics of thermosetting polymers?

A. Heavily branched cross linked polymers.

B. Linear slightly branched long chain molecules.

C. Become infusible on moulding so cannot be reused.

D. Soften on heating and harden on cooling, can be re-used.

Answer: A::C

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3. Which of the following polymers are thermoplastic?

A. Teflon

B. Natural rubber

C. Neoprene

D. Polystyrene

Answer: A::D

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4. Which of the following polymers are used as fibre ?

A. Polytetrafluoroethane

B. Polychloroprene

C. Nylon

D. Terylene

Answer: C::D

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5. Which of the following are addition polymers?

A. Nylon

B. Melamine formaldehyde resin

C. Orlon

D. Polystyrene

Answer: C::D

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6. Which of the following polymers are condensation polymes?

A. Bakelite

B. Teflon

C. Butyl rubber

D. Melamine formaldehyde resin

Answer: A::D

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7. Which of the following monomers form biodegradable polymers?

A. 3-hydroxybutanoic acid + 3-hydroxypentanoic acid

B. Glycine + amino caproic acid

C. Ethylene glycol + phthalic acid

D. Caprolactum

Answer: A::B

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

A. Polychloroprene

B. Polyacrylonitrile

C. Runa-N

D. cis-polyisoprene

Answer: A::C

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9. Which of the following polymers can have strong intermolecular forces?

A. Nylon

B. Polystyrene

C. Rubber

D. Polyesters

Answer: A::D

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10. Which of the following polymers have vinylic monomer units

A. Acrilan

B. Polystyrene

C. Nylon

D. Teflon

Answer: A::B::D

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11. Vulcanisation makes rubber

A. more elastic

B. soluble in inorganic solvent

C. crystalline

D. more stiff

Answer: a,d

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Ncert Exemplar Problems Short Answer Type Questions

1. A natural linear polymer of 2 methyl -1,3 - butadiene becomes hard on treatment with suphur between 373 to 415 K and -s - s- bonda are formed between chains.Write the structure of the product of this treatment?

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2. Identify the type of polymer.

$-A-A-A-A-A-A-$

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3. Identify the type of polymer

-A-B-B-A-A-A-B-A-

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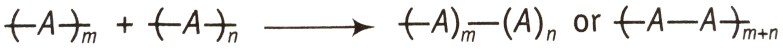
4. out of chain growth polymerisation and step growth polymerisation,in which type will you place the following



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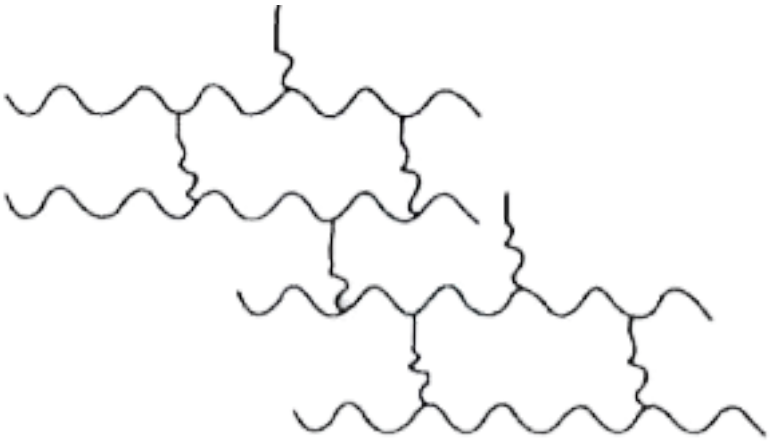
5. Identify the type of polymer given in the following figure.



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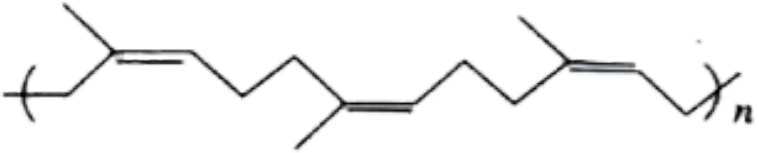
6. Identify the polymer given below :



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7. Why are rubber called elastomers?

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8. Can enzyme be called a polymer?

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9. Can nucleic acid protein and starch be considered as step growth polymers?

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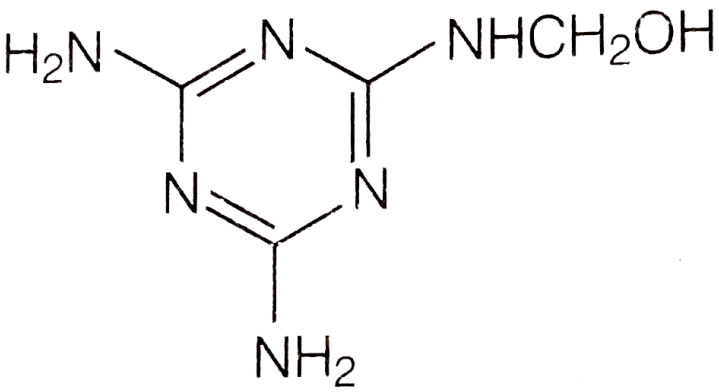
10. How is the following resin intermediate prepared and which polymers is formed by this monomer unit?



Resin intermediate

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11. To have practical applications why are cross links quetioined in rubber?

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12. Why does cis polyisoprene posses elastic porperty?

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13. What is the structural difference between HDP and LDP? How does the structure account for different behaviour and nature hence use of polymer?

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14. What is the role of benzoyl peroxide in addition polymerisation of alkenes? Explain its mode of action with the help of an example

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15. Which factor imparts crystalline nature to a polymer like nylon?

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16. Name the polymer used in laminating sheets and give the name of monomeric units involved in its formation

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17. Which type of biomolecules have some structural similarity with synthetic cpolyamides? What is similarity?

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18. Why should the monomer used in addition polymerisation through free radical pathway be very pure?

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Ncert Exemplar Problems Matching Type Questions

1. Match the polymer of column I with correct monomer of column II

Column I	Column II
(a) High density polythene	(i) Isoprene
(b) Neoprene	(ii) Tetrafluoroethene
(c) Natural rubber	(iii) Chloroprene
(d) Teflon	(iv) Acrylonitrile
(e) Acrilan	(v) Ethene

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2. Match the polymer given in Column I with their chemical names given in Column II

Column I	Column II
(a) Nylon 6	(i) Polyvinyl chloride
(b) PVC	(ii) Polyacrylonitrile
(c) Acrilan	(iii) Polycaprolactum
(d) Natural rubber	(iv) Low density polythene
(e) LDP	(v) cis-polyisoprene

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3. Match the polymers given in Column I with their commercial names given in Column II.

Column I	Column II
(a) Polyester of glycol and phthalic acid	(i) Novolac
(b) Copolymer of 1, 3-butadiene and styrene	(ii) Glyptal
(c) Phenol and formaldehyde resin	(iii) Buna-S
(d) Polyester of glycol and terephthalic acid	(iv) Buna-N
(e) Copolymer of 1, 3-butadiene and acrylonitrile	(v) Dacron

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4. Match the polymers given in column I with their main applications given in column II

Column I		Column II	
A.	Bakelite	1.	Unbreakable crockery
B.	Low density polyethene	2.	Non-stick cookwares
C.	Melamine-formaldehyde resin	3.	Packaging material for shock absorbance
D.	Nylon-6	4.	Electrical switches
E.	Polytetrafluoroethane	5.	Squeeze bottles
F.	Polystyrene	6.	Tyre, cords

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5. Match the polymers given in column I with the preferred mode of polymerisation followed by their monomers columnII

Column I		Column II	
A.	Nylon-6,6	1.	Free radical polymerisation
B.	PVC	2.	Ziegler-Natta polymerisation or coordination polymerisation
C.	HDP	3.	Anionic polymerisation
		4.	Condensation polymerisation

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6. Match the polymers given in column I with the type of linkage present in them given in column II

Column I		Column II	
A.	Terylene	1.	Glycosidic linkage
B.	Nylon	2.	Ester linkage
C.	Cellulose	3.	Phosphodiester linkage
D.	Protein	4.	Amide linkage
E.	RNA		

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7. Match materials given in column I with the polymers given in column II

Column I		Column II	
A.	Natural rubber latex	1.	Nylon
B.	Wood laminates	2.	Neoprene
C.	Ropes and fibres	3.	Dacron
D.	Polyester fabric	4.	Melamine formaldehyde resins
E.	Synthetic rubber	5.	Urea-formaldehyde resins
F.	Unbreakable crockery	6.	*cis*-polyisoprene

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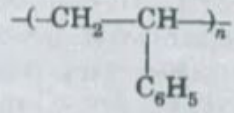
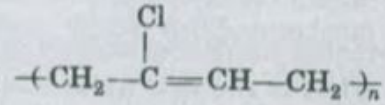
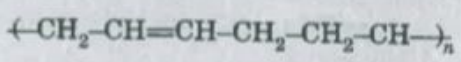
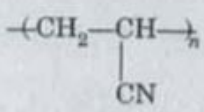
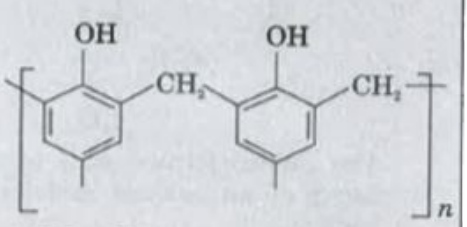
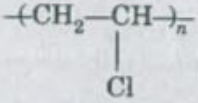
8. Match the polymers given in Column I with their repeating units given in Column II.

Column I	Column II
(a) Acrilan	(i) 
(b) Polystyrene	(ii) 
(c) Neoprene	(iii) 
(d) Novolac	(iv) 
(e) Buna—N	(v) 
	(vi) 

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Ncert Exemplar Problems Assertion And Reason Type Questions

1. Assertion (A) Rayon is a semisynthetic polymer and is taken as a better choice than cotton fabric.

Reason (R) Mechanical and aesthetic properties of cellulose can be improved by Acetylation

A. Assertion and reason both are correct statements but reason does not explain assertion.

B. Assertion and reason both are correct statements and reason explains the assertion.

C. Both assertion and reason are wrong statement.

D. Assertion is correct statement and reason is wrong statement.

Answer: B

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2. Assertion (A) Most of the synthetic polymers are not biodegradable

Reason (R) Polymerisation process induces toxic character in organic molecules

A. Assertion and reason both are correct statements but reason does not explain assertion.

B. Assertion and reason both are correct statements and reason explains the assertion.

C. Both assertion and reason are wrong statement.

D. Assertion is correct statement and reason is wrong statement.

Answer: D

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3. Assertion (A) Olefinic monomers undergo addition polymerisation Reason (R) Polymerisation of vinyl chloride is initiated by peroixdes/persulphates

A. Assertion and reason both are correct statements but reason does not explain assertion.

B. Assertion and reason both are correct statements and reason explains the assertion.

C. Both assertion and reason are wrong statement.

D. Assertion is correct statement and reason is wrong statement.

Answer: A

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4. Assertion (A) Polyamides are best used fas fibres because of high tensile strength.

Reason (R) Strong intermolecular foces (like hydrogen bonding within polyamides) lead to close packing of chains and increase the crystalline character hence , provide high tensile strength to polymers

A. Assertion and reason both are correct statements but reason does not explain assertion.

B. Assertion and reason both are correct statements and reason explains the assertion.

C. Both assertion and reason are wrong statement.

D. Assertion is correct statement and reason is wrong statement.

Answer: B

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5. Assertion (A) For making rubber synthetically isoprene molecules are polymerised .

reason (R) Neoprene (a polymer of chloroprene) is a syntheitc rubber

A. Assertion and reason both are correct statements but reason does not explain assertion.

B. Assertion and reason both are correct statements and reason explains the assertion.

C. Both assertion and reason are wrong statement.

D. Assertion is wrong statement and reason is correct statement.

Answer: D

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6. Assertion (A) Network polymers are thermosetting

Reason (R) Network Polymers have high molecular mass

A. Assertion and reason both are correct statements but reason does not explain assertion.

B. Assertion and reason both are correct statements and reason explains the assertion.

C. Both assertion and reason are wrong statement.

D. Assertion is correct statement and reason is wrong statement.

Answer: A

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7. Assertion (A) : Polytetrafluoroethene is used in making non stick cookwares.

Reason (R) : Fluorine has highest electronegativity.

A. Assertion and reason both are correct statements but reason does not explain assertion.

B. Assertion and reason both are correct statements and reason explains the assertion.

C. Both assertion and reason are wrong statement.

D. Assertion is correct statement and reason is wrong statement.

Answer: A

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Quick Memory Test Accelerate Your Potential For Objective Questions A Say True Of False

1. Caprolactum is a monomer of nylon 6, 6.

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2. Buna-S is a polymer of :

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3. Bakelite is an example of

Watch Video Solution

4. Terylene is a :

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5. Ethylene glycol and phthalic acid are monomers of glyptal.

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6. POLYTHENE FORMATION

Watch Video Solution

7. Write two examples of synthetic polymers

Watch Video Solution

8. Which characterises the weak intermolecular forces of attraction in a liquid?

Watch Video Solution

9. Assertion : Teflon is used to making oil seals, gaskets and non-stick surface coating .

Reason : Teflon is chemically inert and resistant to attack by corrosive reagents.

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10. Assertion : Bakelite is formed when novalac is heated with formaldehyde and it is a thermosetting polymer.

Reason : Bakelite is an infusible solid mass

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Quick Memory Test Accelerate Your Potential For Objective Questions B Complete The Missing Links

1. Hexamethylenediamine and adipic acid are monomers of .....

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2. Buna-S is a polymer of :

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3. The process of vulcanization was introduced by .....

Watch Video Solution

4. Nylon 6 is obtained by polymerisation of .....

Watch Video Solution

5. The polymer used for making nonstick utensils is .....

Watch Video Solution

6. Natural rubber is a polymer of

Watch Video Solution

7. The trade name of polyacrylonitrile is .....

Watch Video Solution

8. The thermosetting polymer whose one monomer is phenol ..... is

Watch Video Solution

9. Terylene is a polymer of ..... and .....

Watch Video Solution

10. Formaldehyde is one of the monomers of ..... and.....

Watch Video Solution

11. The monomers of nylon-2-nylon-6 are ..... and.....

Watch Video Solution

12. PHBV is biodegradable polymer and its monomers are ..... and .....

Watch Video Solution

13. In Buna-S, the symbol S stands for :

Watch Video Solution

14. Di-n-butylphthalate is a .....

Watch Video Solution

15. Structure of (monomer unit of) natural rubber is:

Watch Video Solution

Quick Memory Test Accelerate Your Potential For Objective Questions C Choose The Correct Alternative

1. Dextron is a polyamide / polyester polymer which is widely used as a suture.

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2. In nylon, intermolecular forces of attraction are hydrogen bonding / dipole interactions.

Watch Video Solution

3. PHBV is a biodegradable / non biodegradable polymer.

Watch Video Solution

4. Buna-S is a homopolymer or copolymer.

Watch Video Solution

5. The monomers of bakelite are formaldehyde and phenol / ethylene glycol.

Watch Video Solution

6. Is $(NH-CHR-CO)_n$ a homopolymer or copolymer?

Watch Video Solution

7. Assertion : Nylon-6 is condensation polymer

Reason : It is polymer of caprolactum

Watch Video Solution

8. Natural rubber is vulcanized by heating it with

Watch Video Solution

9. Buna-N and Buna-S are examples of elastomers/ thermoplastics.

View Text Solution

10. Polythene is thermoplastic /thermosetting polymer.

Watch Video Solution

Revision Exercises Objective Questions Multiple Choice Questions

1. ~ $\left[NH(CH_2)NHCO(CH_2)_4CO\right]$ ~ is a

A. addition polymer

B. thermosetting polymer

C. homopolymer

D. co-polymer

Answer: D

Watch Video Solution

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

A. Teflon

B. Rubber

C. Styrene

D. Nylon-6,6

Answer: D

Watch Video Solution

3. Which of the following is a polyamide ?

A. Teflon

B. Nylon-6,6

C. Terylene

D. Bakelite

Answer: B

Watch Video Solution

4. Which of the following is fully fluorinated polymer?

A. Neoprene

B. Teflon

C. Thiokol

D. PVC

Answer: B

Watch Video Solution

5. Caprolactum polymerises to give:

A. Nylon-6

B. Buna-S

C. Glyptal

D. Teflon

Answer: A

Watch Video Solution

6. Poly $-\beta$ - hydroxybutyrate - co$-\beta-$ hydroxyvalerate (PHBV) is a copolymer of _____.

A. thermoplastics

B. naturally occurring polymer

C. biodegradable polymer

D. synthetic rubber

Answer: C

Watch Video Solution

7. Polystyrene is a

A. addition polymer

B. thermoplastic polymer

C. both (a) and (b)

D. none of these

Answer: B

Watch Video Solution

8. Cellulose is a

A. natural polymer

B. semi-synthetic polymer

C. synthetic polymer

D. none of these

Answer: A

View Text Solution

9. Buna - S is a

A. addition polymer

B. condensation polymer

C. both (a) and (b)

D. none of these

Answer: A

Watch Video Solution

10. Bakelite is an example of

A. addition polymer

B. thermoplastic polymer

C. elastomer polymer

D. thermosetting polymer

Answer: D

Watch Video Solution

11. Which of the following is called a polyamide?

A. Rayon

B. Nylon

C. Terylene

D. Bakelite

Answer: B

View Text Solution

12. Which is a condensation polymer?

A. PVC

B. Teflon

C. Bakelite

D. None of these

Answer: C

View Text Solution

13. Bakelite is a product of the reaction between:

A. Formaldehyde and NaOH

B. Aniline and Urea

C. Phenol and Methanol

D. Phenol and Formaldehyde

Answer: D

Watch Video Solution

14. Vulcanisation makes rubber

A. more elastic

B. soluble in inorganic solvent

C. crystalline

D. none of these

Answer: A

Watch Video Solution

15. Neoprene is a polymer of

A. Chloroprene

B. Isoprene

C. Styrene

D. Ethene

Answer: A

View Text Solution

16. The monomer unit of PVC is:

A. vinyl chloride

B. ethylene

C. chloroprene

D. acrylonitrile

Answer: A

Watch Video Solution

17. Which of the following is not applicable to Nylon-6, 6 ?

A. Synthetic polymer

B. fibre

C. Addition polymer

D. Condensation polymer

Answer: D

View Text Solution

18. In the following, thermosetting polymer is :

A. Bakelite

B. Polythene

C. Polyester

D. Buna –N

Answer: A

View Text Solution

19. Monomer of teflon is :

A. $CF_2 = CF_2$

B. $CH_2 = CHCN$

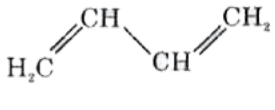
C. $CH_2 = CH_2$

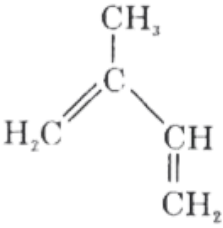
D. $C_6H_5CH = CH_2$

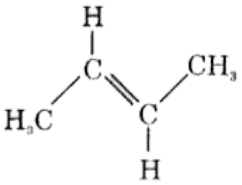
Answer: A

View Text Solution

20. Which of the following can be considered as the monomer of natural rubber?

A. 

B. 

C. 

D. $CH_3 - CH_2 - CH = CH_2$

Answer: B

View Text Solution

1. Match the polymer (column I) with the class of polymer (column II)

Column I	Column II
(*i*) Polymer of glycine and ε-aminocaproic acid	(*A*) Polyester
(*ii*) Nylon 6, 6	(*B*) Polyamide
	(*C*) Biodegradable
	(*D*) Natural

A. $(i) - (C), (ii) - (B)$

B. $(i) - (A), (ii) - (B)$

C. $(i) - (B), (ii) - (D)$

D. $(i) - (C), (ii) - (A)$

Answer: A

View Text Solution

2. Match the polymer (column I) with its type (column II)

Column I	Column II
(*i*) Polystyrene	(*A*) Elastomers
(*ii*) Terylene	(*B*) Fibres
(*iii*) Buna–N	(*C*) Thermosetting
	(*D*) Thermoplastic

A. $(i) - (D), (ii) - (A), (iii) - (B)$

B. $(i) - (A), (ii) - (D), (iii) - (C)$

C. $(i) - (D), (ii) - (B), (iii) - (A)$

D. $(i) - (D), (ii) - (A), (iii) - (C)$

Answer: C

View Text Solution

3. Match the polymer (column I) with its monomer/monomers (column II)

Column I	Column II
(*i*) Glyptal	(*A*) Ethylene glycol and phthalic acid
(*ii*) Bakelite	(*B*) Phenol, acetaldehyde
(*iii*) Terylene	(*C*) Ethylene glycol, terephthalic acid
	(*D*) Phenol, formaldehyde

A. $(i)-(A),(ii)-(D),(iii)-(C)$

B. $(i)-(C),(ii)-(D),(iii)-(A)$

C. $(i)-(A),(ii)-(B),(iii)-(C)$

D. $(i)-(B),(ii)-(C),(iii)-(D)$

Answer: A

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4. Match the polymer (column I) with its important use (column II)

Column I	Column II
(*i*) Teflon	(*A*) safety helmets
(*ii*) Lexan	(*B*) unbreakable crockery
(*iii*) Nylon-6, 6	(*C*) non-stick utensils
	(*D*) cords and climbing ropes

A. $(i)-(C),(ii)-(D),(iii)-(B)$

B. $(i)-(C),(ii)-(B),(iii)-(D)$

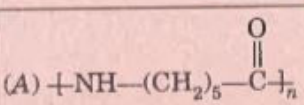
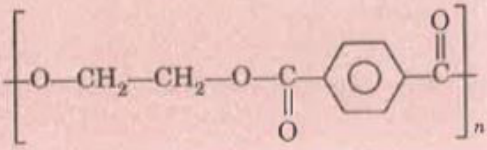
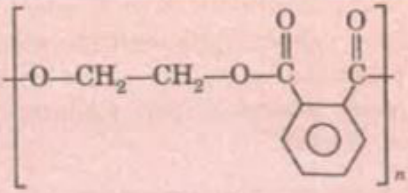
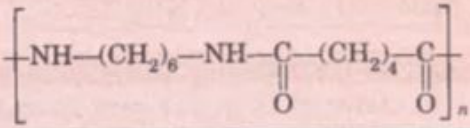
C. $(i)-(B),(ii)-(C),(iii)-(D)$

D. $(i)-(C),(ii)-(A),(iii)-(D)$

Answer: D

View Text Solution

5. Match the polymer (column I) with its structural formula (column II)

Column I	Column II
(i) Nylon-6,6	(A) 
(ii) Dacron	(B) 
(iii) Nylon-6	(C) 
(iv) Glyptal	(D) 

A. $(i) - (C), (ii) - (B), (iii) - (A), (iv) - (D)$

B. $(i) - (D), (ii) - (B), (iii) - (A), (iv) - (C)$

C. $(i) - (C), (ii) - (B), (iii) - (D), (iv) - (A)$

D. $(i) - (B), (ii) - (C), (iii) - (A), (iv) - (D)$

Answer: B

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Revision Exercises Objective Questions Multiple Choice Questions Passage Based Questions

1. What is the function of sulphur in the vulcanization of rubber?

View Text Solution

2. Rubber is a naturally occurring polymer, which is a linear polymer of isoprene. It can be easily deformed but regains its original shape after the stress is relieved. The properties of natural rubber can be modified and improved by process of vulcanization. It is mixed with 3 to 5% sulphur and heated at 373-423 K. This forms cross links through disulphide bonds $(-S-S-)$, which make rubber hard, tough with greater tensile strength. There are many different formulations of synthetic rubbers. These are copolymers in which one of the monomer is isoprene. Some common examples are neoprene rubber, Buna-S, Buna-N, etc.

Does natural rubber has cis- or trans-configuration about the double bonds?

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3. Rubber is a naturally occurring polymer, which is a linear polymer of isoprene. It can be easily deformed but regains its original shape after the stress is relieved. The properties of natural rubber can be modified and improved by process of vulcanization. It is mixed with 3 to 5% sulphur and heated at 373-423 K. This forms cross links through disulphide bonds $(-S-S-)$, which make rubber hard, tough with greater tensile strength. There are many different formulations of synthetic rubbers. These are copolymers in which one of the monomer is isoprene. Some common examples are neoprene rubber, Buna-S, Buna-N, etc.

What is the structure and IUPAC name of monomers of natural rubber?

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4. Rubber is a naturally occurring polymer, which is a linear polymer of isoprene. It can be easily deformed but regains its original shape after the stress is relieved. The properties of natural rubber can be modified and improved by process of vulcanization. It is mixed with 3 to 5% sulphur and heated at 373-423 K. This forms cross links through disulphide bonds $(-S-S-)$, which make rubber hard, tough with greater tensile strength. There are many different formulations of synthetic rubbers. These are copolymers in which one of the monomer is isoprene. Some common examples are neoprene rubber, Buna-S, Buna-N, etc.

Name the monomers of synthetic rubber Buna-S.

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5. Rubber is a naturally occurring polymer, which is a linear polymer of isoprene. It can be easily deformed but regains its original shape after the stress is relieved. The properties of natural rubber can be modified and improved by process of vulcanization. It is mixed with 3 to 5% sulphur and heated at 373-423 K. This forms cross links through disulphide bonds $(-S-S-)$, which make rubber hard, tough with greater tensile strength. There are many different formulations of synthetic rubbers. These are copolymers in which one of the monomer is isoprene. Some common examples are neoprene rubber, Buna-S, Buna-N, etc.

What does the letter 'N' stands for in synthetic rubber Buna-N.

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6. Polymers are high molecular mass substances consisting of large number of repeating structural units derived from simple molecules. The polymers formed from one type of monomers are called

homopolymers and those formed from two or more different monomers are called copolymers. Depending upon the molecular forces between monomers, polymers may be classified as elastomers, fibers, thermoplastic and thermosetting polymers. The polymers may be formed simply by addition of monomers called addition polymers or by combination of two or more monomers by elimination of simple molecules, called condensation polymers.

Is $\left(- - NH - \underset{\underset{R}{|}}{CH} - CO - - \right)_n$ a homopolymer or a copolymer?

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7. Polymers are high molecular mass substances consisting of large number of repeating structural units derived from simple molecules. The polymers formed from one type of monomers are called homopolymers and those formed from two or more different monomers are called copolymers. Depending upon the molecular

forces between monomers, polymers may be classified as elastomers, fibers, thermoplastic and thermosetting polymers. The polymers may be formed simply by addition of monomers called addition polymers or by combination of two or more monomers by elimination of simple molecules, called condensation polymers.

What is the primary structural feature necessary for a monomer to form condensation polymer?

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8. Polymers are high molecular mass substances consisting of large number of repeating structural units derived from simple molecules. The polymers formed from one type of monomers are called homopolymers and those formed from two or more different monomers are called copolymers. Depending upon the molecular forces between monomers, polymers may be classified as elastomers, fibers, thermoplastic and thermosetting polymers. The polymers may be formed simply by addition of monomers called

addition polymers or by combination of two or more monomers by elimination of simple molecules, called condensation polymers.

Name a synthetic polymer which is an ester.

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9. Polymers are high molecular mass substances consisting of large number of repeating structural units derived from simple molecules. The polymers formed from one type of monomers are called homopolymers and those formed from two or more different monomers are called copolymers. Depending upon the molecular forces between monomers, polymers may be classified as elastomers, fibers, thermoplastic and thermosetting polymers. The polymers may be formed simply by addition of monomers called addition polymers or by combination of two or more monomers by elimination of simple molecules, called condensation polymers.

Give one example each of addition and condensation polymer.

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10. Polymers are high molecular mass substances consisting of large number of repeating structural units derived from simple molecules. The polymers formed from one type of monomers are called homopolymers and those formed from two or more different monomers are called copolymers. Depending upon the molecular forces between monomers, polymers may be classified as elastomers, fibers, thermoplastic and thermosetting polymers. The polymers may be formed simply by addition of monomers called addition polymers or by combination of two or more monomers by elimination of simple molecules, called condensation polymers.

Name condensation polymer whose one monomer is methanal.

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Revision Exercises Objective Questions Multiple Choice Questions Assertion Reason Questions

1. Assertion : Vulcanization increases the hardness of natural rubber. Reason: Vulcanization introduces the polysulphide bridges at reactive sites.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: A

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2. Assertion : Most of the synthetic polymers are not biodegradable.

Reason : Nylon-2-nylon-6 is a biodegradable polymer.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: B

View Text Solution

3. Assertion : Bakelite is hard and cannot be remoulded and recycled.

Reason : Bakelite is a thermoplastic polymer.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: C

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4. Assertion : Natural rubber is soft, sticky and has less tensile strength.

Reason : Natural rubber is a polymer of 2-methyl buta-1, 3-diene monomers.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: B

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5. Assertion : Both Buna-N and Buna-S have buta-1, 3- diene monomers.

Reason : Both are polyamides.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: C

View Text Solution

6. Assertion : Nylon 6, 6 is prepared by condensation Reason polymerisation of hexamethylenediamine and terephthalic acid.

Reason : Nylon 6, 6 is a fibre polymer.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: D

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Revision Exercises Objective Questions Very Short Answer Questions

1. Write the IUPAC name of the monomer of natural rubber.

View Text Solution

2. Explain the term addition-polymerisation with an example.

View Text Solution

3. What are plasticizers ? Give one example.

View Text Solution

4. Write the name of one copolymer.

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5. What is the name of polymer which is also known as orlon ?

Watch Video Solution

6. What is a biodegradable polymer ? Give an example of a biodegradable aliphatic polyester.

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7. What does the designation '6,6' mean in the name nylon-6,6 ?

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8. What are the monomeric units of nylon-6, 6 ?

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9. Define the term, 'homopolymerisation' giving an example.

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10. Write the monomers of bakelite.

Watch Video Solution

11. What are monomer units of glyptal?

Watch Video Solution

12. Explain the term co-polymerization with example.

Watch Video Solution

13. What are biodegradable polymers ?

Watch Video Solution

14. Write monomer unit of $\left[- - \overset{O}{\overset{\|}{C}} - (CH_2)_5 - \overset{H}{\overset{|}{N}} - - \right]$ polymer.

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

(i)Buna-S,(ii)Buna-N

(iii)Dacron,(iv)Neoprene

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16. Write the name and structure of the monomers of Buna-N.

View Text Solution

17. Polymer obtained by reaction by rection of phenol and formaldehyde is :

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18. Give the monomers of nylon-66.

Watch Video Solution

19. What is the primary structural feature necessary for a molecule to make it useful in a condensation polymerisation reaction ?

Watch Video Solution

20. Is $\left(-CH_2-\underset{Cl}{\underset{|}{CH}} \right)_n$ a homopolymer or copolymer ?

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21. Give one example of a condensation polymer.

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22. Which of the following is a natural polymer?

Buna-S, Proteins, PVC

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23. Neoprene is a polymer of

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Revision Exercises Objective Questions Short Answer Questions

1. What are elastomers ? Write the chemical equation to represent the preparation of Buna-S

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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

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3. Draw the structures of the monomers of the following polymers :

(i) Teflon (ii) Polyvinyl chloride (PVC) (iii) Melamine-formaldehyde polymer

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4. What is the repeating unit in the condensation polymer obtained by combining $HO_2CCH_2CH_2COOH$ (succinic acid) and $H_2NCH_2CH_2NH_2$ (ethylene diamine)?

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5. In which classes, the polymers are classified on the basis of molecular forces ?

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6. What is vulcanisation? How does it improve the quality of rubber?

Watch Video Solution

7. What are homopolymers and co-polymers ? Give one example of each

Watch Video Solution

8. (i) What is vulcanisation of rubber ?

(ii) What is the monomer of natural rubber ?

(iii) Define elastomer.

Watch Video Solution

9. What is the difference between addition and condensation polymersiation give an examples.

Watch Video Solution

10. Write the names and structures of the monomers of the following polyers :

(i) Buna -S

(ii) Neoprene

(iii) Teflon

Watch Video Solution

11. What are biodegradable polymers and non-biodegradable polymers ? Write one example of each.

Watch Video Solution

12. (a) Give the common and IUPAC name of the monomer of natural rubber.

(b) How is high density polythene obtained? What structural difference it has from low density polythene?

(c) Name a copolymer which is used for making non- breakable plastic crockery?

(d) Write the names and give the structures of the monomers of Nylon-6,6.

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13. What is vulcanisation? Give two points of differences between natural rubber and vulcanised rubber.

Watch Video Solution

14. (a) What are the monomer units of the polymer nylon-2- nylon-6? Is this polymer biodegradable?

(b) What are elastomers? Give one example.

Watch Video Solution

15. (a) What is Buna-S? Give two uses of it.

Watch Video Solution

16. What are biodegradable polymers ?

Watch Video Solution

17. (a) What are polymers?

(b) Name the monomers of polythene, teflon and nylon- 6,6.

Watch Video Solution

18. (a) What is vulcanisation of rubber ?

(b) What is the role of sulphur in vulcanization of rubber ?

Watch Video Solution

19. In which classes, the polymers are classified on the basis of molecular forces ?

Watch Video Solution

20. Differentiate between thermoplastic and thermosetting polymers . Give one example of each.

Watch Video Solution

21. Give synthesis of Buna-S

Watch Video Solution

22. Giving one example of each of :

(i) addition polymers

(ii) condensation polymers

(iii) copolymers.

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23. Write the monomers used for preparing the following polymers:

(i) Glyptal (ii) Nylon-6,6

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24. (a) Give one example of addition homopolymer.

(b) Mention one use each of LDP and HDP.

(c) What is the monomer unit of natural rubber ?

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25. (a) Define condensation polymer. Write the chemical equation for the synthesis of bakelite.

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26. What are homopolymers and co-polymers ? Give one example of each

Watch Video Solution

27. Differentiate between thermoplastic and thermosetting polymers . Give one example of each.

Watch Video Solution

28. (a) Give monomer unit :

(i) Terylene (ii) PVC (iii) Nylon- 6,6 (iv) PAN (v) Natural Rubber (vi) Teflon

(b) Write the name of monomer units of Dacron and mention one use of it.

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29. Write the monomer and one use of bakellite.

Watch Video Solution

30. Give monomer name and preparation of Nylon 6,6.

Watch Video Solution

31. Write the structures of monomers used for getting the following polymers:

(i) Nylon-6,6

(ii) Glyptal

(iii) Buna-S

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32. Differentiate between condensation and addition polymerisation. Give one example each of the resulting polymers.

Watch Video Solution

33. Differentiate between thermoplastic and thermosetting polymers . Give one example of each.

Watch Video Solution

34. Define thermoplastics and thermosetting polymers with two examples of each.

Watch Video Solution

35. What is a biodegradable polymer ? Give an example of a biodegradable aliphatic polyester.

Watch Video Solution

36. Write the names and strutures of the monomers of the following polymers:

(i) Nylon-6 (ii) Novolac (iii) Buna-N

Watch Video Solution

37. (i) What is the role of t-butyl peroxide in the polymerization of ethene?

(ii) Identify the monomers in the following polymer:

$NH-(CH_2)_6-NH-CO-(CH_2)_4-CO_n$

(iii) Arrange the following polymers in the increasing order of their intermolecular forces :

Polystyrene, Terylene, Buna-S

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38. Write the free radical mechanism for the polymersation of ethene.

Watch Video Solution

39. Write the structures of the monomers used for getting the following polymers:

(a) Polyvinyl chloride (PVC)

(b) Melamine-formaldehyde polymer

(c) Buna-N

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40. Write the structures of the monomers used for getting the following polymers:

(a) Nylon 6,6

(b) melamine-formaldehyde polymer

(c) Buna-S

Watch Video Solution

41. Write the structures of monomers used to obtain the following polymers:

(a) Neoprene

(b) PHBV

(c) Bakelite

Watch Video Solution

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

(i) Buna-S,Nylon-6,Polyvinyl chloride

(ii) Polysterene,Dacron,Buna-N

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43. Write the structures of monomers used for getting the following polymers:

(i) Nylon-6,6

(ii) Glyptal

(iii) Buna-S

Watch Video Solution

44. (a) Arrange the following polymers in increasing order of their intermolecular forces:

Polyvinyl chloride, Neoprene, Terylene

(b) Write one example each of

(i) Natural polymer (ii) Thermosetting polymer

(c) What is the significance of number 6,6, in the polymer nylon-6, 6?

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45. Write the structures of monomers used to obtain the following polymers: (a) Natural Rubber (b) PVC (c) Nylon- 6,6

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46. Write the free radical mechanism for the polymersation of ethene.

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Higher Order Thinking Skills Advanced Level

1. Why should one always use purest monomer in free radical polymerisation reaction ?

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2. Will you prefer to polymerize acrylonitrile under anionic or cationic conditions. Explain.

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3. Can a co-polymer be formed both in additin and condensation polymerisation ?

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4. What is the monomer of $(--CH_2-CH_2-O-CH_2-CH_2-O--)_n$?

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5. Arrange the following alkenes towards order of increasing reactivity in cationic polymerization:

$H_2C = CHCH_3, CICH = CH_2, H_2C = CHC_6H_5,$

$H_2C = CHCOOCH_3$

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6. Arrange the following alkenes in order of increasing reactivity towards anionic polymerization.

$H_2C = CF_2, H_2C = CHCN, H_2C = CHCH_3, H_2C = CHC_6H_5$

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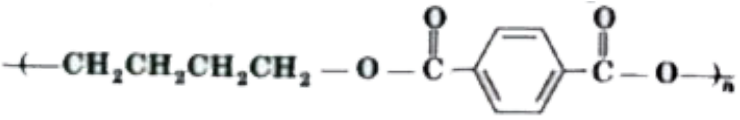
7. Poly (butylenes terephthalate) is a plastic material used in automotive ignition systems and has the formula:



(i) Suggest the monomers which might be used to synthesise this polymer ?

(ii) What type of polymer is it ?

(iii) Is this an addition polymer or condensation polymer ?

(iv) Write the reaction ?

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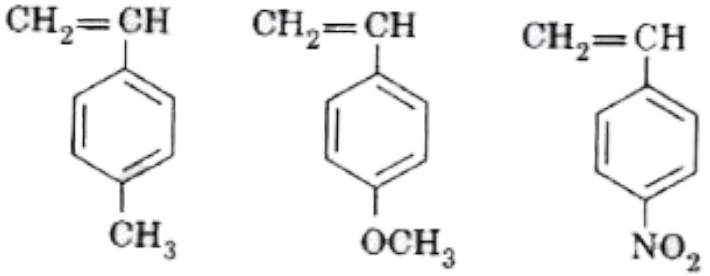
8. Arrange the following groups of monomers in order of decreasing ability to undergo cationic polymerization :



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9. Depict a free radical mode of addition polymerisation in isoprene.

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10. Kodel polyester is formed by trans-esterification of dimethyl terephthalate with 1,4-di (hydroxymehyl) cyclohexane. Write its reaction ?

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Competition File Objective Type Questions A Multiple Choice Questions Polymers And Their Classifications

1. Which of the following is naturally occurring polymer?

A. Polythene

B. Starch

C. Nylon

D. Teflon

Answer: B

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2. Which of the following is not an example of addition polymer?

A. Polystyrene

B. Polyethylene

C. Polypropylene

D. Terylene

Answer: D

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3. Natural rubber is

A. neoprene

B. trans-polyisoprene

C. cis-polyisoprene

D. butyl rubber

Answer: C

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4. Which of the following is not a biopolymer ?

A. Cellulose

B. Proteins

C. DNA

D. Nylon-6,6

Answer: D

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5. Which of the following is not a step growth polymer ?

A. Polybutadiene

B. Nylon-6,6

C. Glyptal

D. Terylene

Answer: A

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6. Which of the following is a copolymer?

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7. Polymer formation from monomers starts by:

A. condensation reaction between monomers

B. coordination reaction between monomers

C. conversion of monomers to monomer ion by protons

D. hydrolysis of monomers

Answer: A

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8. Which of the following polymers contains nitrogen ?

A. Terylene

B. Nylon-6

C. Bakelite

D. Polyvinyl chloride

Answer: B

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9. Which of the following is a thermosetting polymer?

A. Teflon

B. PVC

C. Glyptal

D. Bakelite

Answer: D

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10. Among the following polymers, the strongest molecular forces are present in:

A. fibres

B. elastomers

C. thermosetting polymers

D. thermoplastics

Answer: C

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1. Neoprene is a polymer of

A. chloroprene

B. chloroquine

C. propylene

D. isoprene

Answer: A

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2. The monomer unit of PVC is:

A. vinyl chloride

B. ethylene

C. chloroprene

D. acrylonitrile

Answer: A

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3. Bakelite is the condensation polymer of :

A. C_6H_5OH and caprolactum

B. $HCHO$ and phthalic acid

C. C_6H_5OH and $HCHO$

D. $HCHO$ and ethylene glycol

Answer: C

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4. Nylon-66 is obtained from:

A. hexamethylene diamine and adipic acid

B. phenol and formaldehyde

C. propylene and adipic acid

D. adipic acid and phthalic acid.

Answer: A

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5. Buna-S is obtained by the copolymerisation of butadiene and:

A. chloroprene

B. styrene

C. acrylonitrile

D. adipic acid

Answer: B

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6. Which of the following fibres are made of polyamides?

A. Dacron

B. Orlon

C. Nylon

D. Rayon

Answer: C

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7. Orlon is a polymer of

A. styrene

B. vinyl chloride

C. acrylonitrile

D. butadiene and adipic acid

Answer: C

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8. Which of the following is not a synthetic rubber ?

A. Neoprene

B. SBR

C. Thiokol

D. Orlon

Answer: B

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9. Interparticle forces present in Nylon-6, 6 are,

A. dipole-dipole interactions

B. hydrogen bonding

C. van der Waal's forces

D. ionic bonds

Answer: B

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10. Terylene is a polymer of ethylene glycol and

A. phthalic acid

B. terephthalic acid

C. adipic acid

D. 1,6-hexadiamine

Answer: B

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11. Which of the following is not a biodegradable polymer ?

A. PHBV

B. PGA

C. PMMA

D. PCL

Answer: C

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12. Which of the following statement is not correct regarding vinylic polymerisation ?

A. It involves free radical addition.

B. The presence of carbon tetrachloride in styrene polymerisation results in lowering of average molecular mass of the polymer.

C. The presence of benzoquinone increases the polymerisation process.

D. The presence of CCl_4 acts as inhibitor.

Answer: C

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13. The monomers of terylene are

A. phenol and formaldehyde

B. ethylene glycol and phthalic acid

C. adipic acid and hexamethylenediamine

D. ethylene glycol and terephthalic acid.

Answer: D

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14. Monomer of $\left[- - CH_2 - \underset{\displaystyle COOCH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}} - - \right]_n$ is

A. Methyl methacrylate

B. Styrene

C. Propylene

D. Ethene

Answer: A

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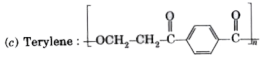
15. Which of the following is not correctly matched ?

A. Neoprene : $\left[- - CH_2 - \underset{\displaystyle Cl}{\overset{|}{C}} = CH - CH_2 - - \right]_n$

B. Nylon - 66 :

$$-\left[--NH-(CH_2)_6-NH-CO-(CH_2)_4-\overset{O}{\overset{||}{C}}--\right]_n$$

C. (c) Terylene : 

D. PMMA :

$$\left[\begin{array}{c} CH_3 \\ | \\ --CH_2-C-- \\ | \\ COOCH_3 \end{array}\right]_n$$

Answer: C

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Competition File Objective Type Questions B Multiple Choice Questions Aipmt Neet Other State Boards Medical Entrance

1. Which one of the following statements is not true ?

A. Natural rubber has the trans- configuration at every double bond

B. Buna-S is a copolymer of butadiene and styrene

C. Natural rubber is a 1, 4-polymer of isoprene

D. In vulcanization, the formation of sulphur bridges between different chains make rubber harder and stronger

Answer: A

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2. Plexiglass is

A. glyptal

B. polyacrylonitrile

C. polymethyl methacrylate

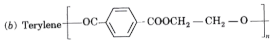
D. polyethylacrylate

Answer: C

Watch Video Solution

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

A. Neoprne $\left[- \ - CH_2 - \underset{Cl}{C} = CH - CH_2 - CH_2 - \ - \right]_n$

B. 

C. Nylon 6,6 $\left[- \ - NH(CH_2)_6 NHCO(CH_2)_4 - CO - \ - \right]_n$

D. Teflon $\left[- \ - CF_2 - CF_2 - \ - \right]_n$

Answer: A

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4. The polymer used in orthopaedic devices and in controlled drug release is:

A. Orlon

B. PTFE

C. SBR

D. PHBV

Answer: D

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5. Which of the following statements is false?

A. Artificial silk is 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 polymers of glucose

Answer: B

Watch Video Solution

6. Nylon is an example of

A. Polyamide

B. Polythene

C. Polyester

D. Polysaccharide

Answer: A

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

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

B. $CH_2 = CH \equiv CH$

C. $CH_2 = CH - CH = CH_2$

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

Answer: A

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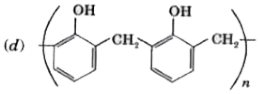
8. Which one of the following is an example of thermosetting polymer ?

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

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

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

D. 

Answer: D

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9. Which of the following organic compounds polymerize to form the polyester Dacron?

A. Propylene and para $HO - (C_6H_4) - OH$

B. Benzoic acid and ethanol

C. Terephthalic acid and ethylene glycol

D. Benzoic acid and para $HO - (C_6H_4) - OH$

Answer: C

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10. Which one of the following is an example of biodegradable polyester?

A. PHBV

B. PET

C. Nylon 6

D. Bakelite

Answer: A

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

A. polystyrene

B. Teflon

C. polypropylene

D. low density polythene.

Answer: D

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12. Caprolactam, is used for the manufacture of

A. Terylene

B. Nylon – 6,6

C. Nylon - 6

D. Teflon

Answer: C

Watch Video Solution

13. Biodegradalbe polymer whichcan be produced from glycine and aminocaproic acid is

A. buna - N

B. nylon 6,6

C. nylon - 2 - nylon 6

D. PHBV

Answer: C

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14. Natural rubber has :

A. alternate cis- and trans-configuration

B. random cis-and trans-configuration

C. all cis-configuration

D. all trans-configuration.

Answer: C

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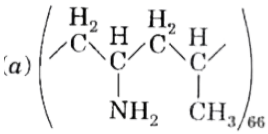
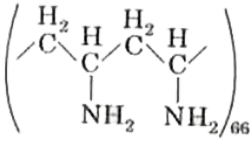
15. Which one of the following structures represents nylon-6,6 polymer?

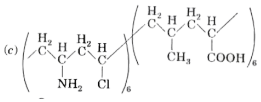
A.

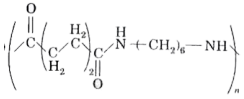


B.



C.



D. 

Answer: D

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16. Regarding cross-linked or network polymers, which of the following statements is incorrect?

A. They contain covalent bonds between various linear polymer chains.

B. They are formed from bi- and tri-functional monomers.

C. Examples are bakelite and melamine.

D. They contain strong covalent bonds in their polymer chains.

Answer: D

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17. The biodegradable polymer is :

A. buna-S

B. nylon-6,6

C. nylon-2-nylon 6

D. nylon-6

Answer: C

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Competition File Objective Type Questions B Multiple Choice Questions Jee Main Other State Boards For Engineering Entrance

1. Bakelite is obtained form phenol by reacting with:

A. $HCHO$

B. $(CH_2OH)_2$

C. CH_3CHO

D. CH_3COCH_3

Answer: A

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2. Match list I with list II and select the correct answer using the codes given below:

List I (Polymers)	List II (Monomers)
1. Buna - N	A. Phthalic acid and ethylene glycol
2. Nylon -6, 6	B. Terephthalic acid and ethylene glycol
3. Dacron	C. Hxamethylenediamine and adipic acid
4. Glyptal plastic	D. Isobutylene and isoprene
	E. Acrylonitrile and butadiene

A. $1-B, 2-A, 3-D, 4-E$

B. $1-C, 2-D, 3-A, 4-B$

C. $1-D, 2-C, 3-B, 4-A$

D. $1-E, 2-C, 3-B, 4-A$

Answer:

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3. The polymer containing strong intermolecular forces, e.g., hydrogen bonding is:

A. Polystyrene

B. Natural rubber

C. Teflon

D. Nylon 6, 6

Answer: D

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4. Natural polymer amongst the following is

A. Cellulose

B. Kodel

C. Nylon

D. Terylene

Answer: A

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5. The species which can best serve as an initiator for the cationic polymerization is:

A. HNO_3

B. $AICI_3$

C. BuLi

D. $LiAlH_4$

Answer: B

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

A. Terylene

B. Buna-S

C. Buna-N

D. Neoprene

Answer: A

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7. 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. hexamethylenediamine and adipic acid

Answer: C

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8. In Buna-S symbol 'Bu' stands for:

A. 1-butene

B. n- butane

C. 2-butene

D. butadiene

Answer: D

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9. The repeating unit present in nylon-6 is:

A. $-\left[NH(CH_2)_6NHCO(CH_2)_4CO\right]-$

B. $-\left[CO(CH_2)_5NH\right]-$

C. $\left[CO(CH_2)_6NH\right]-$

D. $-\left[CO(CH)_2\right)_4NH\Big]-$

Answer: B

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10. Novolac, the linear polymer used in paints is

A. copolymer of buta-1, 3-diene and styrene

B. obtained by the polymerization of methyl methacrylate

C. initial product obtained in the condensation of phenol and formaldehyde in the presence of acid catalyst

D. obtained by the polymerisation of caprolactam.

Answer: C

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11. Which one is classified as a condensation polymer ?

A. Acrylonitrile

B. Dacron

C. Neoprene

D. Teflon

Answer: B

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12. Terylene is not a

A. copolymer

B. polyester fibre

C. chain growth polymer

D. step growth polymer

Answer: C

Watch Video Solution

13. Which polymer is used in the manufacture of paints and lacquers?

A. Polypropene

B. Polyvinyl chloride

C. Bakelite

D. Glyptal

Answer: D

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14. Which of the following statements about low density polythene is false ?

A. Its synthesis requires high pressure.

B. It is a poor conductor of electricity.

C. Its synthesis requires dioxygen or a peroxide initiator as a catalyst.

D. It is used in the manufacture of buckets, dustbins etc.

Answer: D

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15. Correct statement for thermoplastic polymer is

A. It does not become soft on heating under pressure

B. It can not be remoulded

C. It is either linear or branched chain polymer

D. It is cross-linked polymer.

Answer: C

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16. Bulletproof helmets are made from

A. Lexan

B. Saran

C. Glyptal

D. Thiokol

Answer: A

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17. Which of the following is not true?

A. Invulcanisation, the rubber becomes harder and stronger.

B. Natural rubber has 'trans' configuration at every double bond.

C. Buna-S is a co-polymer of butene and styrene.

D. Natural rubber is 1, 4-polymer of isoprene.

Answer: B

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18. On complete hydrogenation, natural rubber produces

A. ethylene-propylene copolymer

B. vulcanised rubber

C. polypropylene

D. polybutylene

Answer: A

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19. Which of the following is not a biodegradable polymer?

A. Glyptal

B. Polyhydroxybutyrate-co-β hydroxyvalerate

C. PHBV

D. Nylon-2-Nylon-6

Answer: A

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20. The monomer used in novolac, a polymer used in paints .

A. butadiene and styrene

B. butadiene and acrylonitrile

C. phenol and formaldehyde

D. melamine and formaldehyde

Answer: C

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21. Protein is a polymer made of

A. carbohydrates

B. amino acids

C. nucleic acids

D. carboxylic acids

Answer: B

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22. What is the IUPAC nomenclature of isoprene molecular present in natural rubber?

A. 2-Methyl-1, 3-butadiene

B. 1, 3-Hexadiene

C. 2, 3-Dimethyl-1, 3-butadiene

D. 2-Methyl-1, 3-pentadiene

Answer: A

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23. The formation of which of the following polymers involves hydrolysis reaction ?

A. Nylon 6

B. Bakelite

C. Nylon 6,6

D. Terylene

Answer: A

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24. Which of the following is a polyamide?

A. Terylene

B. Nylon 6,6

C. Buna-S

D. Terylene

Answer: B

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25. Among the following, the branched chain polymer is

A. polyvinyl chloride

B. bakelite

C. low density polythene

D. high density polythene

Answer: C

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26. Ziegler-Natta catalyst is used to prepare

A. low-density polythene

B. teflon

C. high-density polythene

D. nylon-6

Answer: C

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27. The polymer containing five methylene groups in its repeating unit is

A. nylon-6, 6

B. nylon-6

C. dacron

D. bakelite

Answer: B

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28. Cis-1, 4 polyisoprene is known as

A. Buna-N

B. neoprene

C. Buna-S

D. natural rubber

Answer: D

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29. The polymers which does not become soft on heating and cannot remould or recycled are

A. thermosetting polymer

B. elastomer

C. thermoplastic polymer

D. fibers

Answer: C

Watch Video Solution

30. Which of the following polymers does not involve cross-linkages ?

A. Vulcanized rubber

B. Melamine

C. Bakelite

D. Nylon-6

Answer: D

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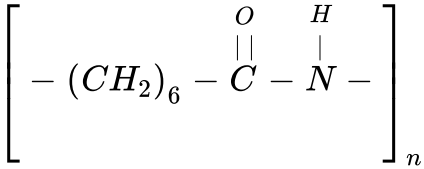
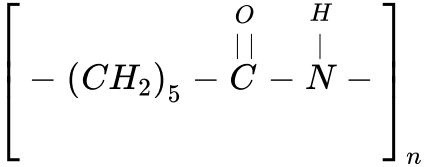
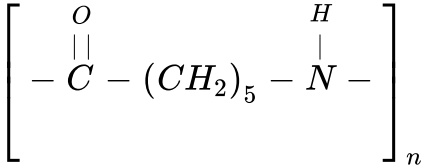
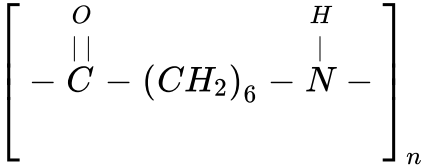
31. Which in the correct structure of Nylon-6

A. 

B. 

C. 

D. 

Answer: C

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32. Which of the following is a condensation polymer?

A. Buna-S

B. Nylon 6, 6

C. Teflon

D. Neoprene

Answer: B

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33. Which of the following is a thermosetting polymer?

A. Buna-N

B. PVC

C. Bakelite

D. Nylon 6

Answer: C

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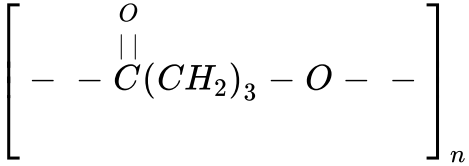
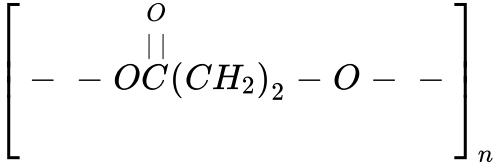
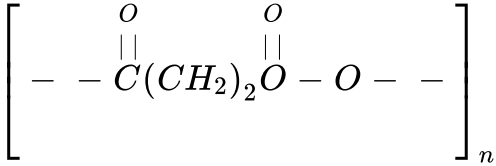
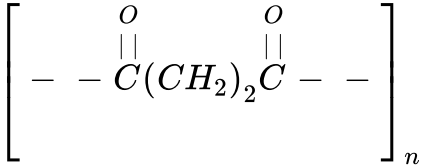
34. The homopolymer formed from 4-hydroxybutanoic acid is :

A. 

B. 

C. 

D. 

Answer: A

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35. The two monomers for the synthesis of Nylon $6, 6$ are :

A. $HOOC(CH_2)_6COOH, H_2N(CH_2)_6NH_2$

B. $HOOC(CH_2)_4COOH, H_2N(CH_2)_4NH_2$

C. $HOOC(CH_2)_6COOH, H_2N(CH_2)_4NH_2$

D. $HOOC(CH_2)_4COOH, H_2N(CH_2)_6NH_2$

Answer: D

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36. Monomer of $\left[NH - \overset{O}{\overset{||}{C}} - NH - CH_2\right]n$ is:

A. Formaldehyde

B. Ammonia

C. Methylamine

D. N-Methyl urea

Answer: A

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37. 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 & pressure
(c)	Novolac	(III)	Ziegler-Natta catalyst
(d)	Nylon 6	(IV)	Acid or base catalyst

A. $(a) \rightarrow (III), (b) \rightarrow (I), (c) \rightarrow (II), (d) \rightarrow (IV)$

B. $(a) \rightarrow (IV), (b) \rightarrow (II), (c) \rightarrow (I), (d) \rightarrow (III)$

C. $(a) \rightarrow (II), (b) \rightarrow (IV), (c) \rightarrow (I), (d) \rightarrow (III)$

D. $(a) \rightarrow (III), (b) \rightarrow (I), (c) \rightarrow (IV), (d) \rightarrow (II)$

Answer: D

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38. Poly $-\beta$ - hydroxybutyrate - co$-\beta-$ hydroxyvalerate (PHBV) is a copolymer of _____.

A. 3-hydroxybutanoic acid and 4-hydroxypentanoic acid

B. 3-hydroxybutanoic acid and 2-hydroxypentanoic acid

C. 2-hydroxybutanoic acid and 3-hydroxypentanoic acid

D. 3-hydroxybutanoic acid and 3-hydroxypentanoic acid

Answer: D

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Competition File Objective Type Questions C Multiple Choice Questions

1. Which of the following are thermosetting polymers ?

A. Melamine

B. Teflon

C. Polystyrene

D. Bakelite

Answer: A::D

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2. Which of the following polymer does not contain 1,3-butadiene as one of the monomers?

A. ABS plastic

B. SBR

C. Saran

D. Nitrile rubber

Answer: A::B::D

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3. The addition homopolymers are :

A. Styron

B. PMMA

C. Terylene

D. Bakelite

Answer: A::B::D

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4. Which of the following contain ethylene glycol as one of the monomers?

A. Melamine

B. Polystyrene

C. Glyptal

D. Terylene

Answer: C::D

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5. Which of the following are biodegradable polymers?

A. PHBV

B. ABS plastic

C. PCL

D. PVC

Answer: A::D

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6. Which of the following can be used as plasticizers ?

A. Cresyl phthalate

B. Diethyl phthalate

C. Polystyrene

D. Trimethyl phosphate

Answer: A::B

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7. Which of the following statements are correct ?

A. Alkyl resins are addition polymers

B. Polystyrene is a thermoplastic

C. Dacron is a fibre

D. Natural rubber behaves as thermosetting polymer.

Answer: B::C

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8. Choose the correct option(s) from the following:

A. Teflon is prepared by heating tetrafluoroethene in presence of a persulphate catalyst at high pressure.

B. Natural rubber is polyisoprene containing trans alkene units.

C. Nylon-6 has amide linkages.

D. Cellulose has only α-D-glucose units that are joined by glycosidic linkages.

Answer: A::C

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Competition File Objective Type Questions C Multiple Choice Questions Matrix Match Type Questions

1. Match the chemical substances in column I with type of polymers/type of bonds in column II.

Column I	Column II
(A) Cellulose	(*p*) natural polymer
(B) Nylon 6,6	(*q*) synthetic polymer
(C) Protein	(*r*) amide linkage
(D) Sucrose	(*s*) glycoside linkage

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2. Match the polymers in Column I with the characteristic listed in Column II.

Column I	Column II
(A) Buna-S	(p) Synthetic polymer
(B) Bakelite	(q) Biodegradable polymer
(C) Teflon	(r) Elastomer
(D) Polylactic acid	(s) Thermoplastic

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Competition File Objective Type Questions C Multiple Choice Questions Integer Type Questions

1. The number of condensation polymers among the following:

nylon 6, glyptal, orlon, terylene, bakelite, PVC, nylon 6, 6, melamine are

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2. How many of the following are synthetic rubbers ?

Buna-S, polystyrene, Buna-N, isoprene, neoprene, thiokol, PVC,

terylene.

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3. How many of the following are elastomers ? Buna-N, nylon 6, Buna-S, neoprene, natural rubber, vulcanized rubber, acrilon, orlon

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4. Amogst the following the total number of thermoplastics is: Polythene, PVC, teflon, PAN, PMMA, polyster, bakelite, nylon 6, melamine formaldehyde.

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5. Number of synthetic polymers among PVC, nylon 6, starch, Buna-N, terylene, bakelite, neoprene, polyisoprene, nylon 6, 6, glyptal,

cellulose are

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6. The total number of lone pairs of electrons in melamine is:

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