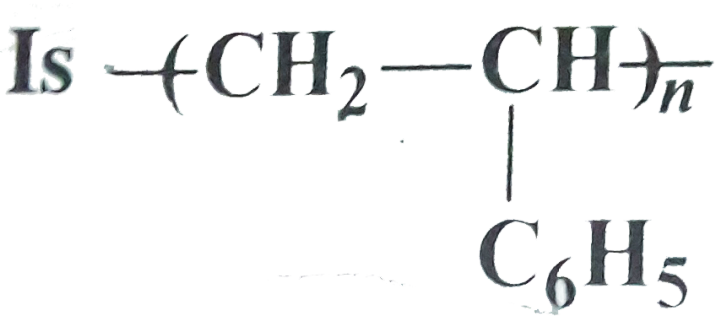
CHEMISTRY

BOOKS - CENGAGE CHEMISTRY (ENGLISH)

SYNTHETIC AND NATURAL POLYMERS

Illustration

1. Is  a homopolymer or a copolymer?Is it an addition or a condensation polymer?

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2. How does the presence of benzoquionone inhibit the free radical polymerization of a vinyl derivative.

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3. Calaulate the average molecules mass of a polymer sample in which 30% molecules have a molecular mass of $20,000, 40\%$ have $30,000$,and the rest 30% have $60,000$

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4. It is easier to brominate aniline as compared to benzene.

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5. A Polydisperse mixture of a polymer can be describe by the following composition-molar mass data:

$(Mass\ \%), 25.0, 50.0, 25.0), \left(Mi\left(kgmol^{-1}\right), 1.00, 1.20, 1.40\right)$:}

Calculate the number -average.

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6. Why iron articles are painted?

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Solved Example

1. Give the mathematical expression of dipole moment.

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2. Write electron dot structure (Lewis structure) of Na, Ca, B

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3. Explain the free radical polymerisation of styrene.

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4. Why styrene undergo anionic polymerisation easily.

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5. We should use purest monomer in free radical polymerisation. True/False.

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6. A copolymer of ethene and vinyl chloride contains alternate monomers fo each type.What is the ,mass percentage of vinyl chloride in this copolymer?

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Exercises Concept Application

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 polymerisation.

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

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7. In which classes, the polymers 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 copolymerisation and give two examples.

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10. Write the mechanism of free radical polymerization of ethene.

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11. Define thermoplastic and ther-mosetting polymers. Give one example 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 polymerisation.

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14. How do 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 the monomeric repeating units of Nylon-6 and 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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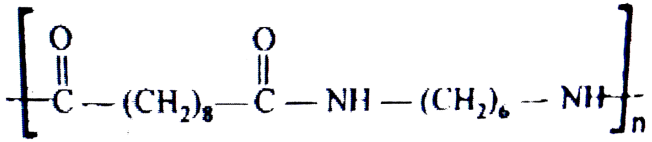
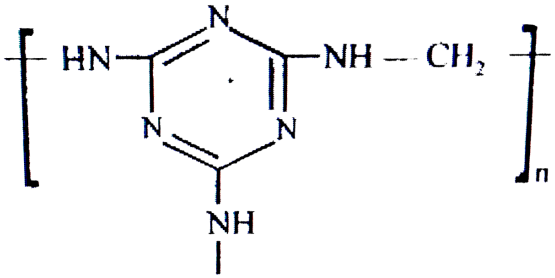
18. Identify the monomer in the following polymeric structures.

(i) 

(ii) 

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

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20. What are biodegradable and non-biodegradable detergents ? Give one example of each.

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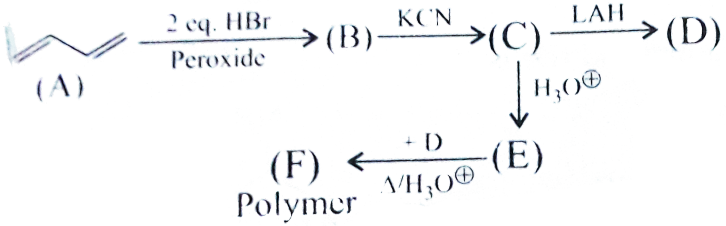
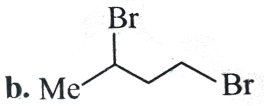
Exercises Linked Comprehension



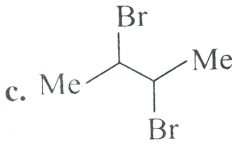
1.

Compund (B) is:

A. $Br(CH_2)_4Br$



B.

C. 

D. All

Answer: A

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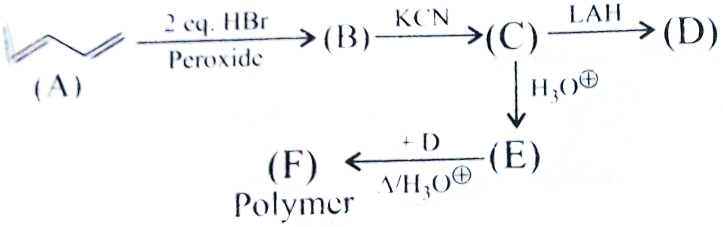
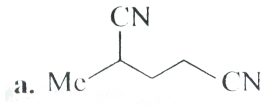
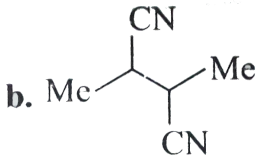
2. 

Compound(C):

a. 

A.



B.

C. $NC(CH_2)_4CN$

D. All

Answer: C

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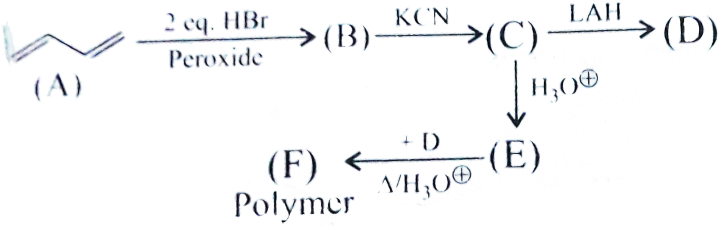

3.

Compound (D)is:

A. $H_2N(CH_2)_4NH_2$

B. $H_2N(CH_2)_6NH_2$

C. $OHC(CH_2)_6CHO$

D. $OHC(CH_2)_6NH_2$

Answer: B

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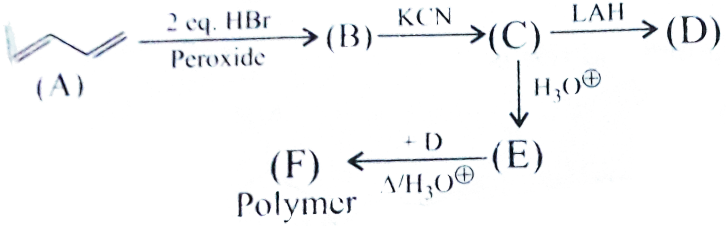

4.

Compound (E)is:

A. $OHC(CH_2)_4CHO$

B. $OHC(CH_2)_4COOH$

C. $HOOC(CH_2)_6COOH$

D. $HOOC(CH_2)_4COOH$

Answer: D

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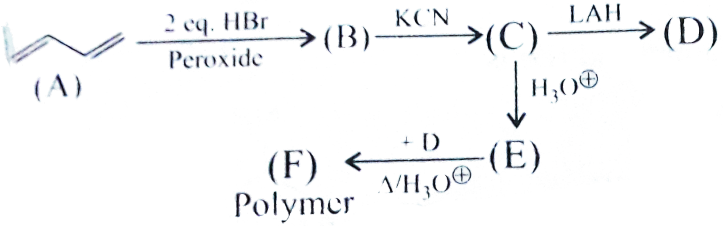

5.

Compound (F) is:

A. Nylon-6

B. Dacron

C. Nylon-6.6

D. Nylon-6.10

Answer: C

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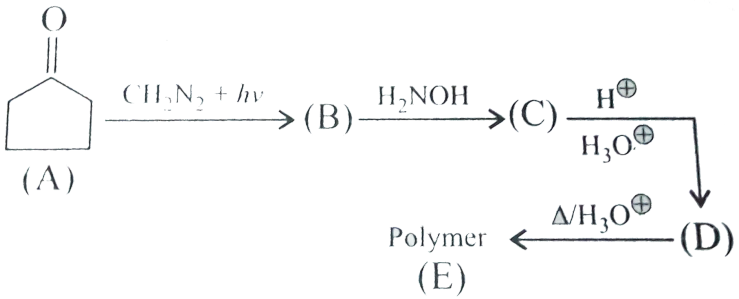
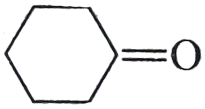
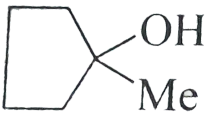
6.

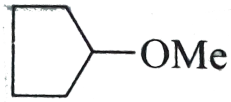


Compund (B) is:

A. a. 

B. b. 

C. c. 

d. 

D.

Answer: B

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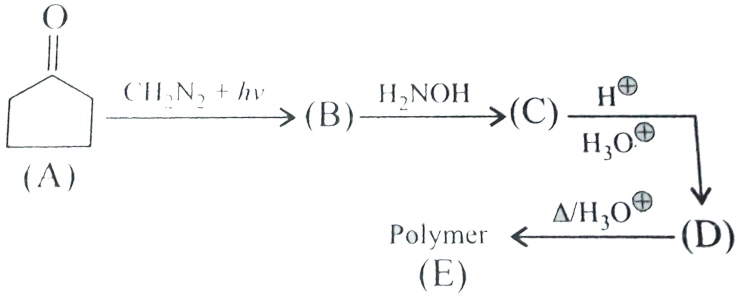
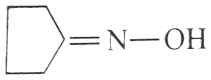
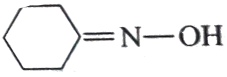


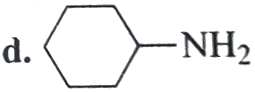
7.

Compound(C):

A. a. 

B. b. 

C. c. 

d. 

D.

Answer: B

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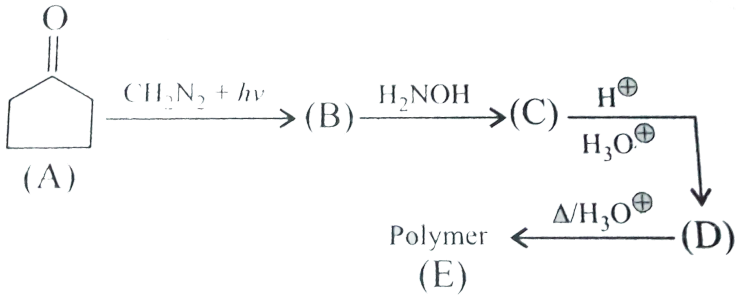
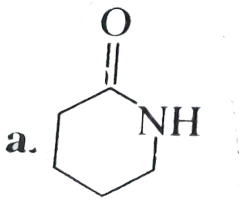


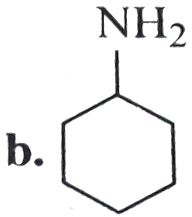
8.

Compound (D)is:

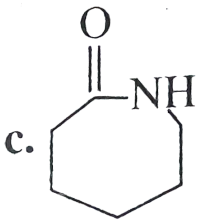
a. 

A.

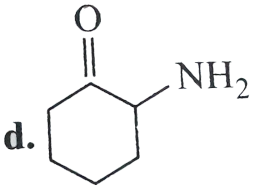
B.



C.



D.



Answer: C

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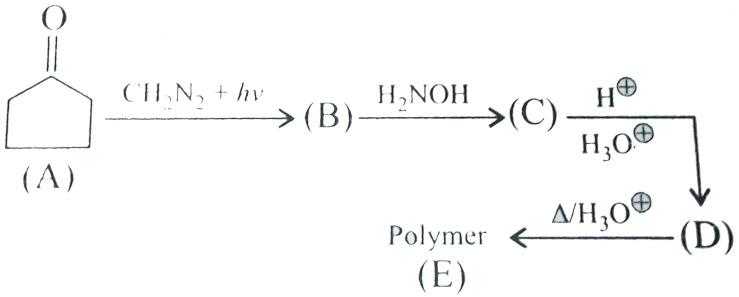

9.

Compound (E)is:

A. Nylon-610

B. Nylon-5

C. Nylon-6

D. Perlon-L

Answer: C::D

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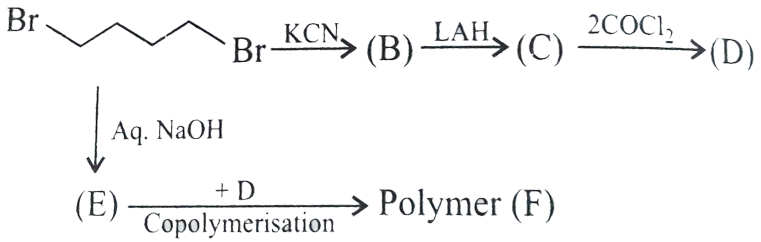

10.

Compund (B) is:

A. $Br(CH_2)_4CN$

B. $NC(CH_2)_4CN$

C. $NA(CH_2)_6Br$

D. $NC(CH_2)_6CN$

Answer: B

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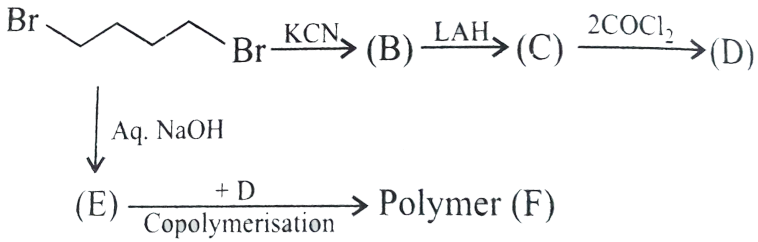

11.

Compound(C):

A. $H_2N(CH_2)_4NH_2$

B. $H_2N(CH_2)_6NH_2$

C. $OHC(CH_2)_4CHO$

D. $OHC(CH_2)_6CHO$

Answer: B

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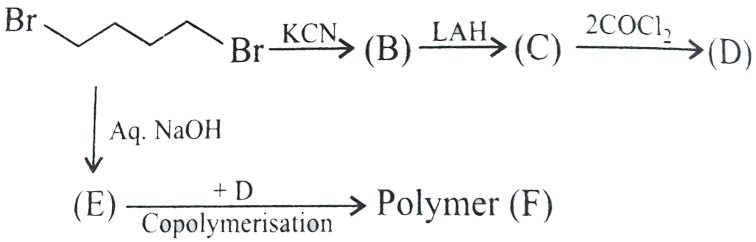

12.

Compound (D)is:

A. $O=C=N(CH_2)_6N=C=O$

B. $\overset{\ominus}{C}\equiv\overset{\oplus}{N}-(CH_2)_6\overset{\oplus}{N}\equiv\overset{\ominus}{C}$

C. $O=C=N(CH_2)_4N=C=O$

D. $\overset{\ominus}{C}\equiv\overset{\oplus}{N}-(CH_2)_4N=C=O$

Answer: A

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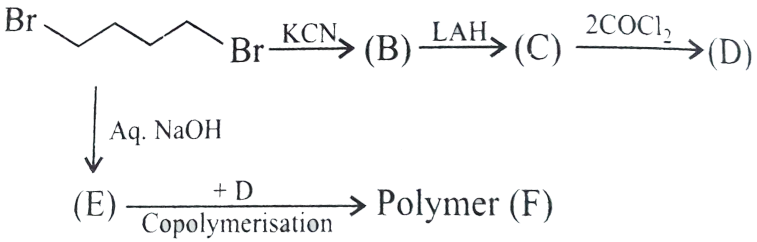
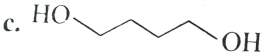


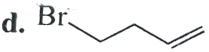
13.

Compound (E)is:

A. 

B. $Me - \equiv - Me$

C. 

D. 

Answer: C

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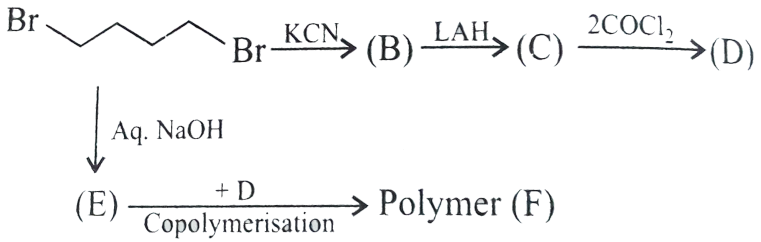

14.

Compound (F) is:

A. Polyurethane

B. Perlon-U

C. Perlon L

D. Nylon-6

Answer: A::B

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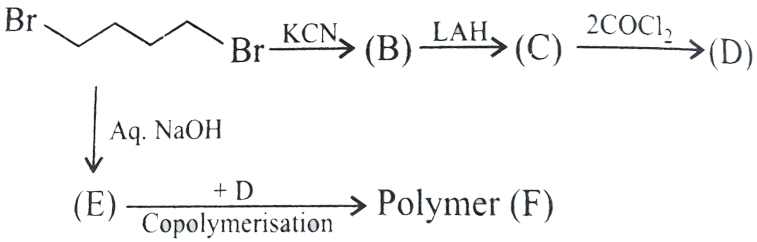

15. Which of the following group does polymer(F) contains?

A. Polyamide

B. Polyurethane

C. Polycarbamate ester

D. Polyester

Answer: B::C

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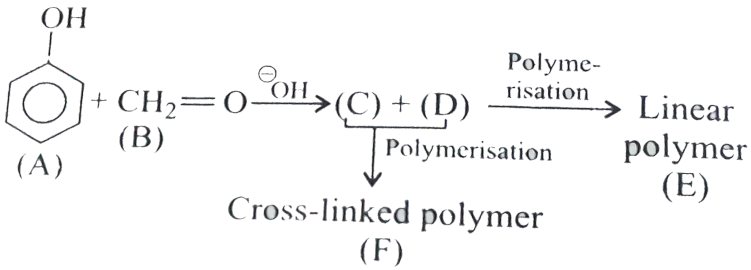
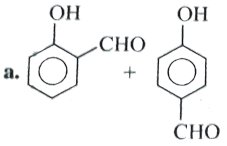
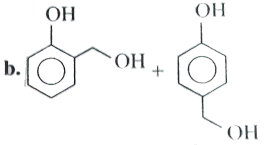
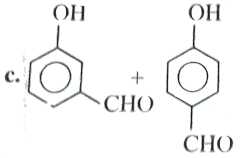


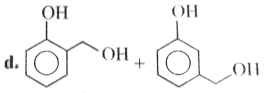
16.

Compound (C) and(D) are:

A. 

B. 

C. 

D. 

Answer: B

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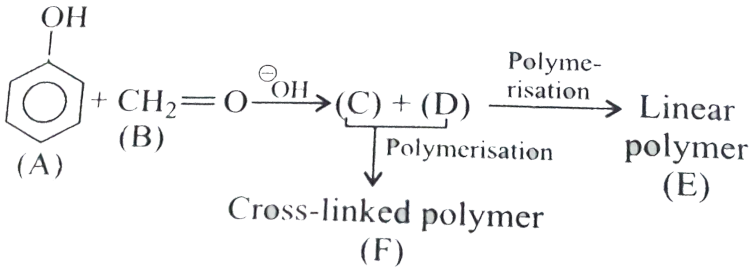

17.

The linear polymer$(E)$is:

A. Resol

B. Novolac

C. Bakelite

D. Decron

Answer: A::B

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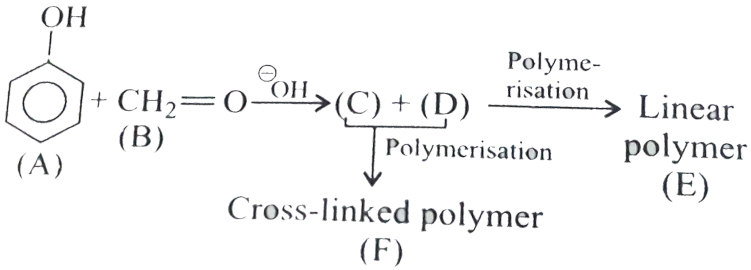

18.

The cross-linked polymer$(F)$is:

A. Resol

B. Novolac

C. Bakelite

D. Decron

Answer: C

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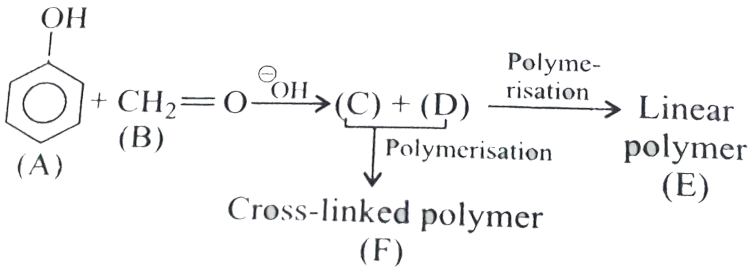

19.

The linear polymer$(E)$is formed is:

A. $\frac{P}{F}\left(\frac{Phenol}{F \text{ or } maldehyde}\right) = 1$

B. $\frac{P}{F} > 1$

C. $\frac{P}{F} < 1$

D. None

Answer: B

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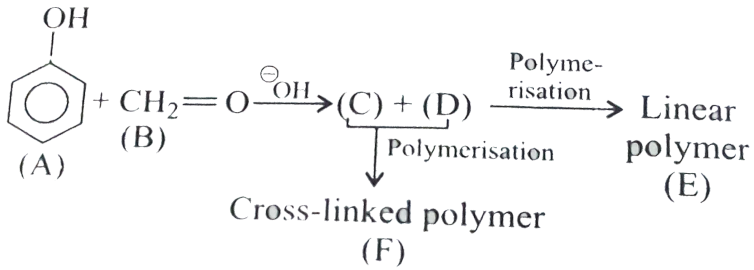

20. Which of th following statement is/are correct about the polymer(E)?

A. It is thermoplastic polymer

B. It is thermosetting polymer.

C. It is used in the manufacture of adhesive

D. It is used in the manufacture of swiyches and plugs.

Answer: A::C

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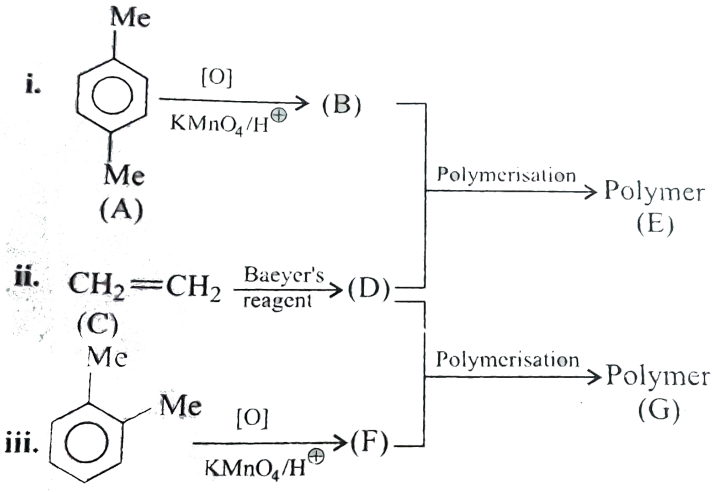

21.

Polymer$(E)$is:

A. Dacron

B. Terylene

C. Myler

D. All

Answer: D

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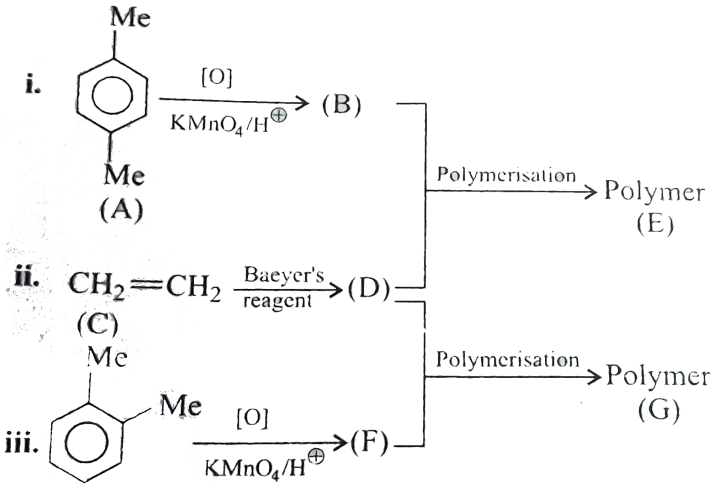

22. Polymer (G) is:

A. Dacron

B. Terylene

C. Glyptal resins

D. All

Answer: C

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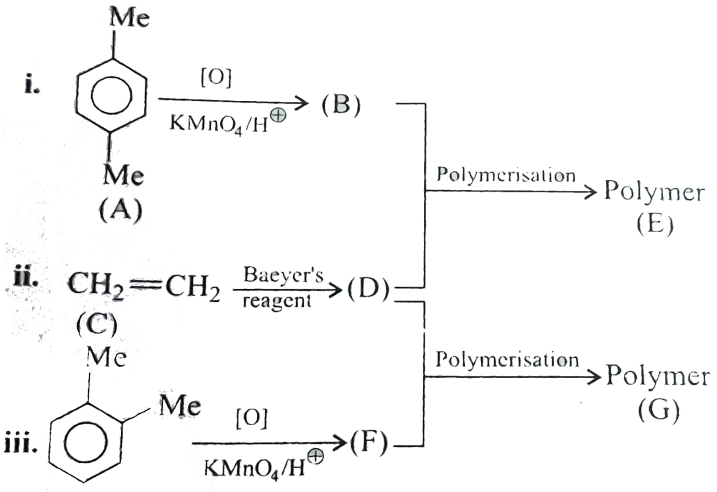

23.

Which of the following groups does polymer(E)contain?

A. Polyamide

B. Polyester

C. Polyurethane

D. Polycarbamate ester

Answer: B

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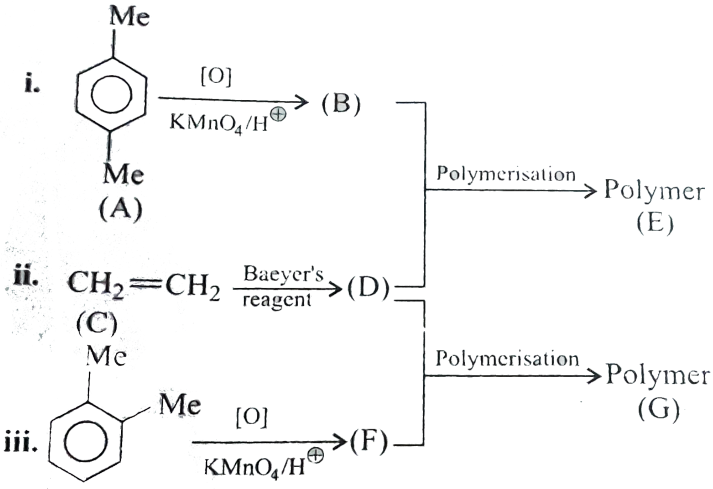


24.

Which of the following grpups polymer (G)contain?

A. Polyamide

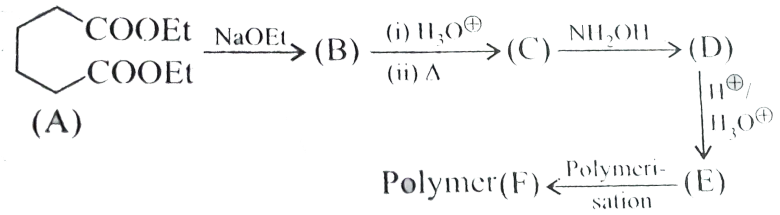
B. Polyester

C. Polyurethane

D. Polycarbamate ester

Answer: B

Watch Video Solution



25.

The conversion (A)(B)`is called?

A. Claisen ester condensation

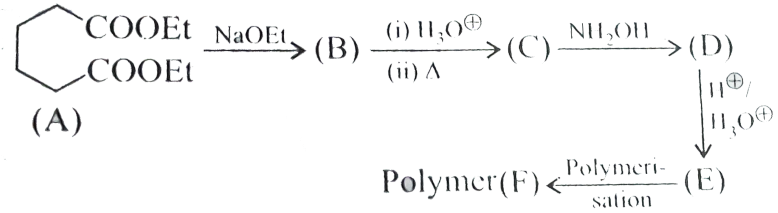
B. Dieckmann reaction

C. Intramolecular Claisen ester Condensation

D. Claisen-Schmidt reaction

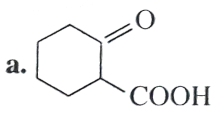
Answer: B::C

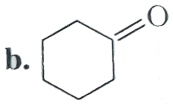
Watch Video Solution

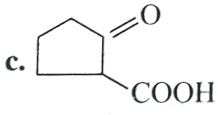


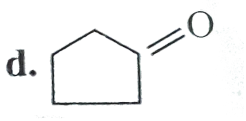
26.

Compound$(C)$is:

A. 

B. 

C. 

d. 

D.

Answer: D

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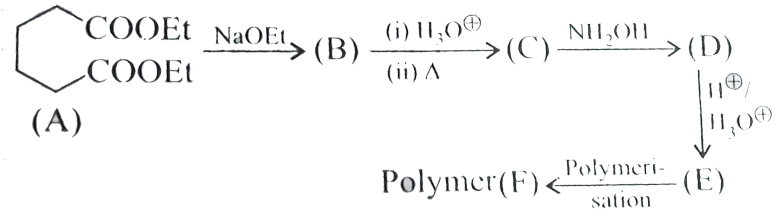


27.

The conversion of (D) to (E) is called:

A. Benzil-Benzillic acid rearrangement reaction

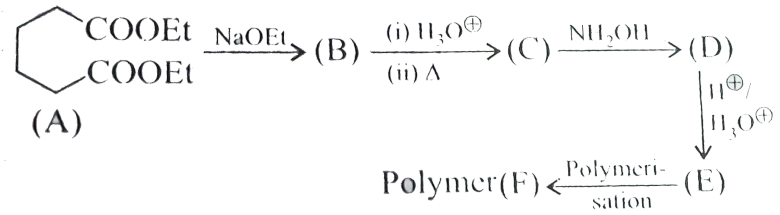
B. Benzoin condensation

C. Beckmann reaction

D. Beckmann rearrangement reaction

Answer: D

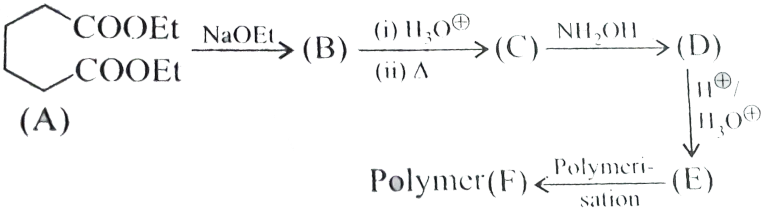
View Text Solution



28.

Product$(C)$is:

Watch Video Solution



29.

Polymer$(D)$is:

A. Nyler-6

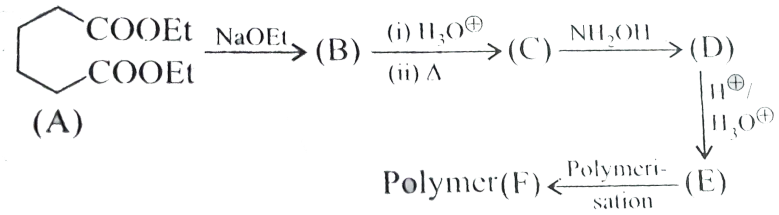
B. Nylor-5

C. Nylor-6.6

D. Nylor-5.5

Answer: B

Watch Video Solution



30.

Which of the following groups does the polymer(F)contain?

A. Polyester

B. Polyamide

C. Polyurethane

D. Polycarbamate ester

Answer: B

View Text Solution

Exercises Multiple Correct

1. Which of the following polymers can be made by cationic addition polymersation mechanism?

A. PVC

B. PP

C. $HDPE$

D. $LDPE$

Answer: B

Watch Video Solution

2. Which of the following polymers can be made by anionic addition polymerisation mechanism?

A. PVC

B.

C. Telflon

D. PP

Answer: A::B::C

Watch Video Solution

3. Which of the following polymers can be made by free radical addition polymersation mechanism?

A. PE

B. $HDPE$

C. $LDPE$

D. Teflon

Answer: A::B::C

Watch Video Solution

4. Which of the following polymers can be made by additional polymersation reaction?

A. Nylon-6

B. Perlon-U

C. $HDPE$

D. $LDPE$

Answer: C::D

Watch Video Solution

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

A. Dacron

B. Nylon-6.6

C. Bakelite

D. PE

Answer: A::B::C

Watch Video Solution

6. Which of the following are plasticisers?

A. DOP

B. DBP

C. Cryesyl phosphate

D. Sodium adipate

Answer: A::B::C

Watch Video Solution

7. Which of the following are polyester polymers?

A. Bakelite

B. Dacron

C. Glyptal resins

D. Nylon5

Answer: B::C

Watch Video Solution

8. Which of the following are polyamide polymers?

A. Nylon $-6, 10$

B. Nylon $-6, 6$

C. Nylon -5

D. Perlon $-U$

Answer: A::B::C

Watch Video Solution

9. Which of the following are polycarbamate ester polymers?

A. Polyurethane

B. Perlon-U

C. Melmac

D. Saran

Answer: A::B

Watch Video Solution

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

A. Nylon fibers have higher tensile strenght than terylene fibers.

B. Nylon fibers have lower tensile strenght than terylene fibers.

C. In nylon, there is strong ihntermolecular H-bonding, while in trylene there is weak dipole-dipole interaction

D. In nylon, there is weak ihntermolecular H-bonding, while in trylene there is strong dipole-dipole interaction

Answer: A::C

Watch Video Solution

11. Which of the following statements are correct about phenol-formaldehyde resin?

A. Novolac or resol is a linear polymer and is used in the manufacture of adhesive.

B. Bakelite is a cross-linked polymer and is used in making switches and plugs.

C. Novolac is preparede when (P/F) (phenol//formaldehyde) ratio is greater than 1, Whereas bakelite is prepared when (P/F) ratio is less than 1.

D. Novolac is prepared when $P/F < 1$, and bakelite is prepared when $P/F > 1$.

Answer: A::B::C

Watch Video Solution

12. Which of the following are biodegradabe polymers?

A. $PHBV$

B. Nylon $-2, 6$

C. Polyglycolic and polylactic acids

D. Perlon-U

Answer: A::B::C

Watch Video Solution

13. Which of the following are used as free radical chain initiators?

A. Benzoyl preoxide

B. t-Butyl peroxide

C. $\mathbb{C}l_4$

D. Benzoquinone

Answer: A::B

Watch Video Solution

14. Which of the following are used as chain transfer agents?

A. $\mathbb{C}l_4$

B. CBr_4

C. Benzoquinone

D. Benzoyl peroxide

Answer: A::B

Watch Video Solution

15. Nylon-$5-10$can be prepared by:

A. $H_2N(CH_2)_5NH_2 +$ Decanoic acid (Sebacic acid)

B. $HOOC(CH_2\_(3)COOH + H_2N(CH_2)_{10}NH_2$

C. $H_2N(CH_2\_(6)NH_2 + HOOC(CH_2)_8COOH$

D. $H_2N(CH_2)_{10}NH_2 + HOOC(CH_2)_4COOH$

Answer: A

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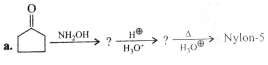
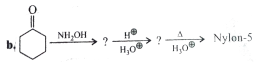
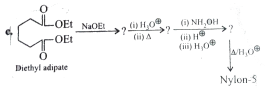
16. Nylon-$5 - 10$can be prepared by:

A. 

B. 

C. 

D. All

Answer: A::C

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17. Which monomer would polymerise in isotactic syndiotactic and atactic forms?

A. $CH_2 \equiv \mathbb{C}l_2$

B. CH_(3)-CH=CH_(2)

C.

D. All

Answer: B::C

Watch Video Solution

18. Polymerisation of buta$-1,3$diene by free radical mechanism gives:

A. trans`-1,4-polybutadiene

B. cis`-1,4-polybutadiene

C. polyvinyl polyethene

D. polyallyl polyethene

Answer: A::B::C

Watch Video Solution

19. Which of the following are biopolymers?

A. Nucleic acids

B. Leather

C. Bakelite

D. Orlon

Answer: A::B

Watch Video Solution

20. Which of the following are condensation copolymers?

A. Nylon -6

B. Nylon-6,6`

C. Dacron

D. Glyptal

Answer: A::B::C::D

Watch Video Solution

21. Which of the following are additional homopolymers?

A. Teflon

B. SBR

C. PVC

D. Natural rubber

Answer: A::C::D

Watch Video Solution

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

A. Wool

B. Natural silk

C. ABS plastic

D. SBR

Answer: A::b

Watch Video Solution

23. Which of the following polymers contain$1, 3, -$ butadiene as one of the monomers?

A. Nylon-6,6`

B. $PHBV$

C. Nylon$-2-$ Nylon-6

D. Polychloroprene

Answer: A::B::C::D

Watch Video Solution

24. Which of the following are biodegradabe polymers?

A. Nylon-6.6,

B. $PHBV$

C. $Nylon-2-Nylon-6$

D. Polychloroprene

Answer: B::C

Watch Video Solution

25. Polymersation may occur through intermediate formation of:

A. Carbocations

B. Carbanions

C. Free radicals

D. Carbenes

Answer: A::B::C

Watch Video Solution

26. Which of the following processes can be used to prepare polystyrene?

A. Anionic

B. Cationic

C. Free radicals

D. Zigler-Natta

Answer: A::B::C::D

 Watch Video Solution

27. Which of the following are not thermosetting polymers?

A. Bakelite

B. Polystyrene

C. PVC

D. Melmac

Answer: B::C

 Watch Video Solution

28. Which of the following can not be used as plasticisers?

A. Sodium nexametaphosphate

B. n-dibutylphthalate

C. Tricresyl phosphate

D. Diethyl-phthalate

Answer: B::C

Watch Video Solution

Exercises Single Correct

1. Natural rubber is:

A. All-trans polyisoprene

B. Chloroprene

C. Buna-S

D. All-cis polyisoprene

Answer: D

Watch Video Solution

2. Which of the following is a step-growth polymer?

A. Polyacrylonitrile

B. polyisoprene

C. Nylon

D. Polythene

Answer: C

Watch Video Solution

3. Which of the following is a chain-growth polymer?

A. Nylon

B. Dacron

C. Glyptal

D. Polypropylene

Answer: D

Watch Video Solution

4. Terylene (Dacron) is the polyester of:

A. Hexamethylenediamine and adipic acid

B. Vinyl chloride and formaldehyde

C. Melamine and formaldehyde

D. Ethylene glycol and terephthalic acid

Answer: D

Watch Video Solution

5. The method of choice for determining the molecular weight of polymer is:

A. Osmotic pressre

B. Gas density

C. Lowering of freezing point

D. Direct weighing of a single molecule

Answer: A

Watch Video Solution

6. All terpenes have carbon skeletons made up of:

A. Isoprenes units

B. Vinyl units

C. Alkenes

D. Ethylene units

Answer: A

Watch Video Solution

7. Isoprene, $CH_2 = \underset{\underset{CH_3}{|}}{C} - CH = CH_2$, is the repeating unit in:

A. Vitamin A

B. Terpenes

C. Rubber (natural)

D. All the above

Answer: D

Watch Video Solution

8. Gutta percha is:

A. trans-Polyisoprene

B. Non-elastic and softense to a plastic-like materialo on heating.

C. Used in underwater cables and golf balls.

D. All the above

Answer: D

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9. `SBR(GRS,Buna-S,Cold Rubber)is obtained by free radical intiator.The most commenly used free radical initiator is:

A. Buta$-1,3-$ dinene (70%) and 30% phenyl ethene (styrene)

B. Chloroprene and styrene

C. Vinyl acetylene and styrene

D. Isoprene and $1, 3 -$ butadiene

Answer: A

Watch Video Solution

10. Free radical polymerisation requires a free radical initior.The most commonly used free radical initiator is:

A. $Ph - CO - O - O - COPh$, benzoylperoxide

B. $(CH_3)_3C - O - O - C(CH_3)_3$, tert-butyl peroxide

C. $C_6H_5 - \underset{\underset{C_6H_5 - N}{||}}{N} \rightarrow O$, azoxybenezene

D. CH_2N_2 , diazomethane

Answer: A

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11. The fields of polymer chemistry was revolutionsed by:

A. Kharasch in USA

B. Karl Ziegler in Germany

C. Giulio Natta in Italy

D. Barton in England

Answer: B::C

Watch Video Solution

12. One would come across the terms isotactic,syndiotactic,and atactic in connection with the chemistry of:

A. Polymers

B. Dyes

C. Crystals

D. Textiles

Answer: A

Watch Video Solution

13. Zeigler-Natta catalyst is

A. Are triethyl aluminium titanium tetrachloride complex $(C_2H_5)_3Al + TiCl_4$.

B. Are used to prepare stereospecific addition polymers.

C. Are employed to have strereochemical

D. All the above.

Answer: A

Watch Video Solution

14. Saran is a copolymer of:

A. Vinyl chloride and vinyl acetate

B. Vinylidence chlorride$(1-1-$ dichroethene $)$and vinyl chloride

C. Ethylene chloride and vinyl chloride

D. Vineyl acetate and methyl acetate

Answer: B

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15. Polyurethanes:

A. Have structure features of both an ester and an amide.

B. Have a formula $H_2N-\underset{\underset{O}{||}}{C}-O-CH_2-CH_3$.

C. Are obtianed from p-phenylene disocyanate and ethylene glycol.

D. Are used as foam rubber in upholstery.

Answer: C

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16. A Copolymer is :

A. Styrene butadiene rubber

B. Polythene

C. Terylene

D. Nylon

Answer: A

Watch Video Solution

17. Which one is not the chain-growth polymer?

A. Natural rubber

B. Polythene

C. Polypropylene

D. Terylene

Answer: D

Watch Video Solution

18. Which one is not a step polymer?

A. Nylon$6, 6$

B. Nylon-6

C. Glyptal

D. $PMMA$

Answer: D

Watch Video Solution

19. The basic unit of neoperene is:

A. Chlororprene

B. Isoprene

C. Styrene

D. Butadiene

Answer: A

Watch Video Solution

20. Nylon-6is prepared from:

A. Adipic acid and hexaamethylene diamine caprolactum

B.

C. Urea of formaldehyde

D. Noen of these

Answer: B

Watch Video Solution

21. Bakelite is :

A. Chain-growth polymer

B. Step-growth polymer

C. Both (a)and(b)

D. Elastomer

Answer: B

Watch Video Solution

22. Molecular weight of macromolecules are determined by:

A. Elevation of boiling point

B. Depression in freezing point

C. Osmotic pressure

D. None of these

Answer: C

Watch Video Solution

23. If $N_1, N_2, N_3, \ldots\ldots$.are the number of molcules with molecular masses $M_1, M_2, M_3, \ldots$.respectively ,then mass average molar mass is expressed as:

A. $\frac{\Sigma NiMi^2}{\Sigma NiMi}$

B. $\frac{\Sigma NiMi}{\Sigma Ni}$

C. $\frac{\Sigma Mi^2}{\Sigma Ni}$

D. $\frac{\Sigma NiMi}{\Sigma Mi}$

Answer: A

Watch Video Solution

24. Glyptal is the polymer of:

A. Ethlene glycol

B. Ethylene glycol and phthalic acid

C. Ethylene glycol and adipic acid

D. Caprolactum

Answer: B

Watch Video Solution

25. Which of the following is a natural polymer?

A. Bakelite

B. Cellulose

C. PVC

D. Neoprene

Answer: B

Watch Video Solution

26. Which one is a synthetic polymer?

A. Starch

B. Silk

C. Protein

D. Neoprene

Answer: D

Watch Video Solution

27. The repeating units of PTFE are

A. $Cl_2CH - CH_3$

B. $F_2C = CF_2$

C. $F_3C - CF_3$

D. $FClC = CF_2$

Answer: B

Watch Video Solution

28. The inter-particle forces between linear chains in nylon-6,6 are

A. H-bonds

B. Covalent bond

C. Ionic-bonds

D. Coordinate bonds

Answer: A

Watch Video Solution

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

A. Nylon-6, 6

B. $PTFE$

C. Dacron

D. Glyptal

Answer: B

Watch Video Solution

30. Which of the following can be remelted time and again without producting any change?

A. Thermosetting polymers

B. Thermoplastic polymers

C. Bakelite

D. Melamine

Answer: B

Watch Video Solution

31. Which of the following is a common example of fibres?

A. Bakelite

B. Buna-S

C. Nylon-6, 6

D. Nylon-6

Answer: C

Watch Video Solution

32. In the vulcanisation of rubber:

A. Sulpher reacts to form a new compound.

B. Sulpher cross-linked are introduced

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

D. All the statements are correct.

Answer: B

Watch Video Solution

33. The weakest interparticle forces are present in:

A. Thermosetting polymers

B. Thermoplastic polymers

C. Fibers

D. Elastomers

Answer: D

Watch Video Solution

34. Which of the following is an example of copolymer?

A. Buna-S

B. PAN

C. polythene

D. $PTFE$

Answer: A

Watch Video Solution

35. Which of the following represent the example of a homopolymer?

A. $PMMA$

B. Bakelite

C. Glyptal

D. $PTFE$

Answer: D

Watch Video Solution

36. The starting material of $PCTFE$is:

A. Monochlortrifluro ethylene

B. Tetrafluoroethylene

C. Vinyl chloride

D. Styrene

Answer: A

Watch Video Solution

37. Cellulose is a condensation polymer is:

A. Maltose

B. β-Glucose

C. α-Glucose

D. β-Fructose

Answer: B

Watch Video Solution

38. The chemical name for 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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39. Which of the following is coated as a thinlayer on the inner side of non stick pans?

A. Bakelite

B. PVC

C. teflon

D. PMMA

Answer: C

Watch Video Solution

40. The abbreviation PDI refers to:

A. name of polymer

B. Poly Disperity Index

C. Polypropylene

D. application of polymer

Answer: B

Watch Video Solution

41. Which polymer is generally used in carry bag?

A. Polyester

B. Bakelite

C. Polyethylen

D. Alkyd resin

Answer: C

Watch Video Solution

42. The polymer obtained from condensation of sebacic acid and hexamethylene diammine is called:

A. Terylene

B. Nylon6

C. Nylon-6, 10

D. Dacron

Answer: C

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43. Vulcacnised rubber resists:

A. Wear and tear due ot friction

B. Cryogenic temperature

C. High Temperature

D. Action of acids

Answer: A::D

Watch Video Solution

44. The commerical name of polymethyl (methacrylate)is:

A. Lucite

B. Plexiglas

C. Perspex

D. All the above

Answer: D

Watch Video Solution

45. The monomer unit of silicon, a water repellant, acid resistantl,and heat resistant,polymer,is:

A. Si

B. SiO_2

C. R_2SiO

D. None of these

Answer: C

Watch Video Solution

46. A polymer of prop-2enenitrile is called:

A. Saran

B. Orlon

C. Dacron

D. Teflon

Answer: b

Watch Video Solution

47. The turbidity of a polymer solution measures:

A. Light absorbed by the solution

B. Light transmitted by the solution

C. Light scattered by the solution

D. None of the above.

Answer: C

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48. Peptide bond is a key feature in:

A. Polysaccharide

B. Proteins

C. Nucleotide

D. Vitamins

Answer: B

Watch Video Solution

49. Synethetic human hair wigs are made from a copolymer of vinyl chloride and acrylintrile ,which is called:

A. PVC

B. Polyacrylonitrile

C. Cellulose

D. Dynel

Answer: D

Watch Video Solution

50. $GR A$is a copolymer of:

A. Butadiene and acrylonitrile

B. Butadiene and adipic acid

C. Chloroprene and acrylonitrile

D. Chloroprene and adipic acid

Answer: A

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51. $Identity$(X):$CHCl_3 \xrightarrow[HF]{SbF_3} CHF_2Cl \xrightarrow{1070K} (X) + 2HCl$

A. $F_2C = CF_2$

B. $CIFC = CFCl$

C. $F_2C = CFCl$

D. $F_2C = \mathbb{C}l_2$

Answer: A

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52. Isotactic polypropylene polymer is one in which:

A. All methyl groups are on one side of the extended chian.it is a highly crystalline,has high melting point,and forms strong fibres.

B. The methyl grouops present alternate regularly from one side to the other.

C. The methyl groups are distributed at ramdom,it is a soft,elastic,and rubbery material

D. None of these

Answer: A

Watch Video Solution

53. If $N_1, N_2, N_3, \ldots\ldots$ are the number of molcules with molecular masses $M_1, M_2, (M_3, \ldots$ respectively ,then mass average molar mass is expressed as:

A. $\frac{N_1M_1^2, N_2M_2^2, + \ldots\ldots}{N_1M_1 \quad N_2M_2 \quad + \ldots\ldots} = \frac{\Sigma NiMi^2}{\Sigma NiMi}$

B. $\frac{N_1M_1, N_2M_2, + \ldots\ldots}{N_1 \quad N_2 \quad + \ldots\ldots} = \frac{\Sigma NiMi}{\Sigma Ni}$

C. $\frac{\Sigma Mi^2}{\Sigma Ni}$

D. $\frac{\Sigma NiMi}{\Sigma Mi}$

Answer: a

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54. Z-average molar mass $(M\bar{z})$ is defined as:

A. $\frac{\Sigma NiMi^2}{\Sigma NiMi}$

B.

C. $\frac{\Sigma NiMi^3}{\Sigma NiMi^2}$

D. $\frac{\Sigma NiMi^3}{\Sigma NiMi}$

Answer: C

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55. Mass-average molecular mass of a polymer is determined by:

A. Light scattering and ultracentrifuge method

B. Osmotic pressure

C. Depression of frezing point

D. Elevation in boiling point

Answer: A

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56. Number-average molecular mass of a polymer is determined by:

A. Light scattering and ultracentrifuge method

B. Osmotic pressure

C. Depression of frezing point

D. Elevation in boiling point

Answer: B

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57. A polymeric sample in which $30\,\%$ molecules have a molecules mass $20,000$,40%, have $30,000$ and the rest $30\,\%$ have $60,000$.The $(M\bar{n})$and $(M\overline{w})$of this sample was:

A. $36,000,43,333$

B. $43,333,36000$

C. $72,000,86,666$

D. $86, 666, 72000$

Answer: A

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58. The PDI(polydispersity index) is the ratio of weight to number-average molecular masses$(M\overline{w})/(M(\bar{n})$ .In natural polymers,which are generally monodispersed,$PDI$is.....and in synthetic polymers which are always polydispersed, PDI is ..... because $M\overline{w}$ is always .....than $M\bar{n}$.

A. Greater then1, 1,higher

B. 1,greater then1,higher

C. less than 1, 1,lower1, less than 1,lower

D.

Answer: B

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59. Formation of polyethyene from calcium carbide takes place is follows :

$CaC_2 + 2H_2O \rightarrow Ca(OH)_2 + C_2H_2$

$C_2H_2 + H_2 \rightarrow C_2H_4$

$$nC_2H_4 \rightarrow (CH_2 - CH_2)_n$$

The amount of polyethylene obtained from $64.0kg$ of CaC_2 is

A. $14kg$

B. $7kg$

C. $21kg$

D. $28kg$

Answer: D

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60. Which one of the following is used to make 'non-stick' cookware

A. Polystrene

B. PVC

C. Poly(ethylene terphthalate)

D. Polytetrafluoroethylene

Answer: D

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61. Whichof the following statement is not true about polymers?

A. Polymer have high visosity.

B. Polymers do not carry any change

C. Polymers scatter light.

D. Polymers have low molecular weight

Answer: D

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62. Natural rubber is a polymer of

A. Styrene

B. Ethylene

C. Butadiene

D. Isoprene

Answer: D

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

A. Dipole-dipole internations

B. Hydrogen bonding

C. van der Waals force

D. None of these

Answer: B

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64. Terylene is a condensation polymer of ethylene glycol and

A. Salicylic acid

B. Phthalic acid

C. Benzoic acid

D. Terepthalic acid

Answer: D

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65. Polymer used in bullet-proof glass is:

A. Neomex

B. Lexan

C. $PMMA$

D. Kevlar

Answer: B

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66. Nylon-6 is made from:

A. Adipic acid

B. Chloroprene

C. $1,3$-Butadiene

D. Phthalic acid

Answer: D

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67. Which is used for formation of nylon 66?

A. Sulphurous acid

B. Adipic acid

C. Sulphurous hexafluoride

D. Phthalic acid

Answer: B

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68. $CF_2 = CF_2$ is monomer of

A. Teflon

B. Glyptal

C. Bunna-S

D. Nylon-6

Answer: A

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69. Soft drinks and baby feeding bottles are generally made up of

A. Polyurea

B. polyester

C. polymide

D. Polystyrene

Answer: D

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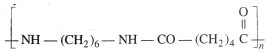
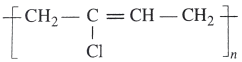
70. Whichof the following statement is not correctly matched?

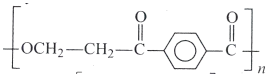
A. Nylon6, 6:



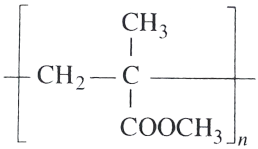
B. Neoprene :



C. Terylene :



D. `PMMA :



Answer: C

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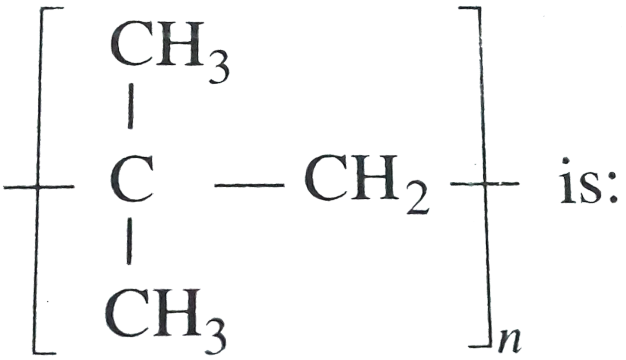
71. Monomer of



is:

A. 2-Methylpropene

B. Ethene

C. Propylene

D. Styrene

Answer: A

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72. Which of the following is used in paints?

A. Terylene

B. Chloroprene

C. Glyptal

D. Nylon

Answer: C

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73. Polymer formation from monomers starts by

A. Condensation reaction between monomers

B. Conversion of monomer to monomer ions by protons

C. Coordination reaction between monomers

D. Hydrolysis of monomers.

Answer: A

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74. Which of the following monomer gives the polymer neoprene on polymerisation?

A. $\mathbb{C}l_2 = \mathbb{C}l_2$

B. $CH_2 = CHCl$

C. $CH_2 = C(Cl) - CH = CH_2$

D. $CF_2 = CF_2$

Answer: C

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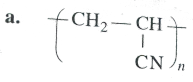
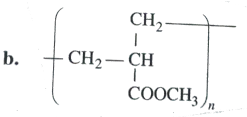
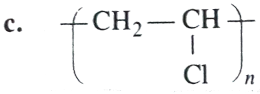
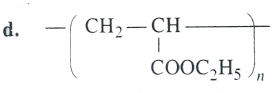
75. Acrolyn is a hard, horny and a high melting material. Which of the following represent its structure?

A. a. 

B. b. 

C. c. 

D. d. 

Answer: A

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76. Nylon threads are made of

A. Polyvinyl polymer

B. Polyethylene polymer

C. Polyester polymer

D. Polyamide polymer

Answer: D

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77. Which among the followning is a branched chain polymer?

A. Nucleic acids

B. Starch

C. Polystyrene

D. Proteins

Answer: C

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78. Which of the following is a biodegradable polymer?

A. Cellulose

B. Nylon -6

C. Polyvinyl chloride

D. Polythene

Answer: A

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79. Which of the following is not correct regarding terylene?

A. Condensation polymer

B. Synthetic fibre

C. Step growth polymer

D. Thermosetting plastic

Answer: D

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80. Orlon has a unit of:

A. Vinyl cyanide

B. Isoprene

C. Glycol

D. Acrolein

Answer: A

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81. Whichof the following is a copolymer?

A. Polytetrafluorethylene

B. Polyvinyl chloride

C. Polyethylene

D. Nylon-6, 6

Answer: D

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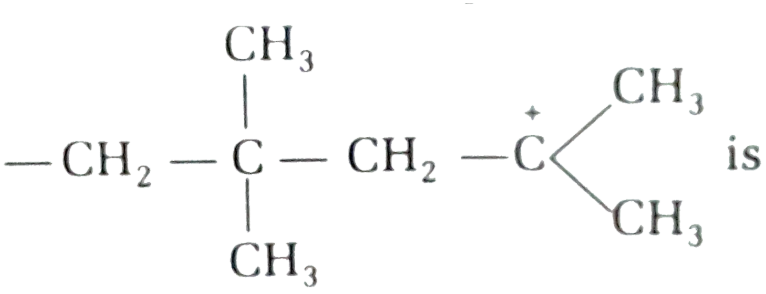
82. The monomer of the polymer



A. $(CH_3)_2C = C(CH_3)_2$

B. $CH_3CH = CH_2$

C. $CH_3CH = CHCH_3$

D. $H_2C = C(CH_3)_2$

Answer: D

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83. Which of the following is fully fluorinated polymer?

A. Thiokol

B. Teflon

C. Neoprene

D. PVC

Answer: B

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84. Whichof the following is not a polymer?

A. Sucrose

B. Teflon

C. Starch

D. Enzyme

Answer: A

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85. Whichof the following is a polymide?

A. Teflon

B. Nylon-6, 6

C. Bakelite

D. Terylene

Answer: B

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86. $\sim\left[\sim NH\,(CH_2)_6\,NHCO\,(CH_2)_4\,CO\sim\right]_n$ is:

A. Additional polymer

B. Copolymer

C. Homopolymer

D. Thermosetting polymer

Answer: B

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87. Which of the following polymer can be used for lubrication and as an insulator?

A. SBR

B. PAN

C. $PTFE$

D. PVC

Answer: C

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88. Which of the following is the biodegradable polymer of polymide class?

A. Nylon-6, 6

B. Nylon-2-nylon-6

C. Dextran

D. $PHBV$

Answer: B

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89. Which of the followingis an additional polymer?

A. Nylon-6, 6

B. Dacron

C. High-density polythene

D. Nylon-6, 6

Answer: C

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90. Chloroprene is the repeating unit in:

A. PVC

B. Neoprene

C. Polystyrene

D. Polythene

Answer: B

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91. Which is not a macromolecules?

A. DNA

B. Insulin

C. Palmitate

D. Starch

Answer: C

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92. Teflon ,styron,and neoprene are all:

A. Copolymers

B. Monomers

C. Homopolymers

D. Condensation polymer

Answer: C

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93. Which of the following sets contains only thermoplastics ?

A. Glyptal,Melmac,PAN

B. Polythene,Bakelite,Nylon-6

C. PVC, $PMMA$,Polystyrene

D. Polypropylene,Urea-formaldehyde ,Teflon

Answer: C

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94. Which fo the following sets contains only copolymers?

A. SBR,Glyptal,Nylon-6, 6

B. Poluthene ,Polyester,PVC

C. Nylon-6,Butyl rubber,Neoprene

D. Melmac,Bakelite,Teflon

Answer: A

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Exercises Assertion Reasoning

1. 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. Statement 1 is true ,statement 2is true,statement2is the correct explanation of statement1

B. Statement 1 is true ,statement 2is true,statement2is not the correct explanation of statement1

C. Statement 1 is true ,statement 2is false

D. Statement 1 is false,statement 2is true

Answer: A

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2. Statement 1:$M\bar{n}$(number -average molecular mass) of a polymer is determined by osmotic pressure method,while$M\overline{w}$ (weight -average molecular mass)is determined by ultracentrifuge method.

Statement 2:Osmotic pressure is a colligative property.

A. Statement 1 is true ,statement 2is true,statement2is the correct explanation of statement1

B. Statement 1 is true ,statement 2is true,statement2is not the correct explanation of statement1

C. Statement 1 is true ,statement 2is false

D. Statement 1 is false,statement 2is true

Answer: A

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3. Statement1:PUF(polyurethane foam) is spongy.

Statement 2:During the preparation of PUF, $CO_2$is evolved ,which forms bubbles that are trapped within the bulk of polymer.As it solidifies ,it gives spongy product.

A. Statement 1 is true ,statement 2is true,statement2is the correct explanation of statement1

B. Statement 1 is true ,statement 2is true,statement2is not the correct explanation of statement1

C. Statement 1 is true ,statement 2is false

D. Statement 1 is false,statement 2is true

Answer: A

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4. Statement 1:Buta-1, 3, -diene is the monomer of Gutta Percha.

Statement 2:Gutta Percha is formed through cationic addition polymerisation.

A. Statement 1 is true ,statement 2is true,statement2is the correct explanation of statement1

B. Statement 1 is true ,statement 2is true,statement2is not the correct explanation of statement1

C. Statement 1 is true ,statement 2is false

D. Statement 1 is false,statement 2is true

Answer: D

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5. Statement 1:Teflon has high thermal stability and chemical inertness.

Statement 2:It has strong $(C-F)$bonds.

A. Statement 1 is true ,statement 2is true,statement2is the correct explanation of statement1

B. Statement 1 is true ,statement 2is true,statement2is not the correct explanation of statement1

C. Statement 1 is true ,statement 2is false

D. Statement 1 is false,statement 2is true

Answer: A

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6. Statement 1:Plexiglas is the commerical name of $PMMA$

Statement 2:It is used in making contact lens.because it has an excellent lighr=transmission property.

A. Statement 1 is true ,statement 2is true,statement2is the correct explanation of statement1

B. Statement 1 is true ,statement 2is true,statement2is not the correct explanation of statement1

C. Statement 1 is true ,statement 2is false

D. Statement 1 is false,statement 2is true

Answer: A

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7. Statement 1:Novolac is soft and has a low melting poitn.

Statement 2:It is a highly crossed -linked polymer.

A. Statement 1 is true ,statement 2is true,statement2is the correct explanation of statement1

B. Statement 1 is true ,statement 2is true,statement2is not the correct explanation of statement1

C. Statement 1 is true ,statement 2is false

D. Statement 1 is false,statement 2is true

Answer: C

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8. Statement-1 : Polybutadiene is an example of chain growth polymer.

Statement-2 : In chain growth polymers, the reactive particles may be free radicals or ions (cations or anions) to which monomers get added by a chain reaction.

A. Statement 1 is true ,statement 2is true,statement2is the correct explanation of statement1

B. Statement 1 is true ,statement 2is true,statement2is not the correct explanation of statement1

C. Statement 1 is true ,statement 2is false

D. Statement 1 is false,statement 2is true

Answer: D

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9. Statement 1:Bakelite is hard and has high melting point

Statement 2:Intermolecular forces of attractions in it are H-bonding.

A. Statement 1 is true ,statement 2 is true,statement 2 is the correct explanation of statement 1.

B. Statement 1 is true ,statement 2 is true,statement 2 is not the correct explanation of statement 1.

C. Statement 1 is true ,statement 2 is false.

D. Statement 1 is false,statement 2 is true.

Answer: C

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10. Statement 1:Nylon fibres are stronger than terylene fibres.

Statement 2:Intermolecular forces of attraction in terylene are H-bonding.

A. Statement 1 is true ,statement 2is true,statement2is the correct explanation of statement1

B. Statement 1 is true ,statement 2is true,statement2is not the correct explanation of statement1

C. Statement 1 is true ,statement 2is false

D. Statement 1 is false,statement 2is true

Answer: C

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