



CHEMISTRY

BOOKS - DISHA PUBLICATION CHEMISTRY (HINGLISH)

POLYMERS

Jee Main 5 Years At A Glance

1. Which of the following statements is not true?

A. Chain growth polymerisation involves homopolymerisation only

B. Chain growth polymerisation includes both homo polymerisation and copolymerisation

C. Nylon 6 is an example of step-growth polymerisation

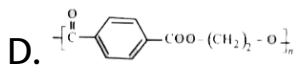
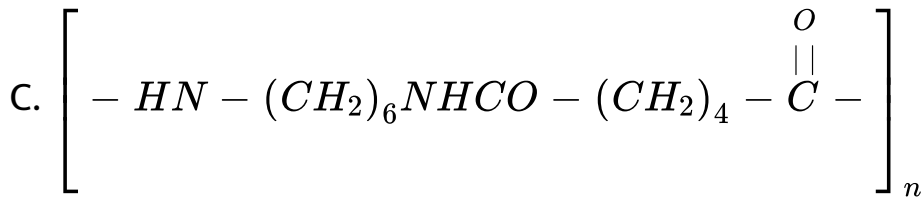
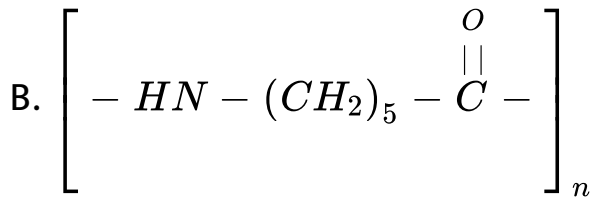
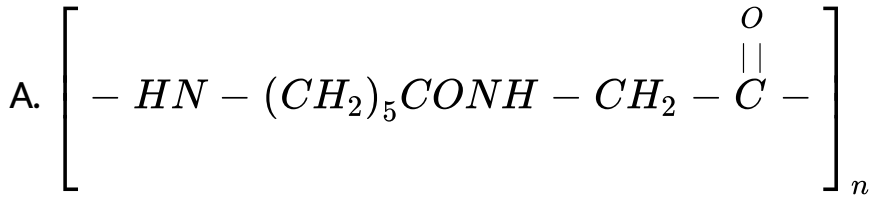
D. Step growth polymerisation requires a bifunctional monomer

Answer: B



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2. Which of the following is a biodegradable polymer ?



Answer: A

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3. 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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4. Which of the following polymers is synthesized using a free radical polymerization technique?

A. Terylene

B. Melamine polymer

C. Nylon 6,6

D. Teflon

Answer: D

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5. 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. Both assertion and reason are correct, but the reason is not the correct explanation for the

assertion

- B. Both assertion and reason are correct, and the reason is the correct explanation for the assertion
- C. Assertion is incorrect statement, but the reason is correct.
- D. Both assertion and reason are incorrect.

Answer: A



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

- A. Its synthesis requires dioxygen or a peroxide initiator as a catalyst.
- B. It is used in the manufacture of buckets, dust-bins etc.
- C. Its synthesis requires high pressure.
- D. It is a poor conductor of electricity

Answer: B

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7. Match the polymers in column -A with their main uses in Column B and choose the correct answer:

	Column - A		Column - B
A.	Polystyrene	i.	Paints and lacquers
B.	Glyptal	ii.	Rain coats
C.	Polyvinyl chloride	iii.	Manufacture of toys
D.	Bakelite	iv.	Computer discs

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

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

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

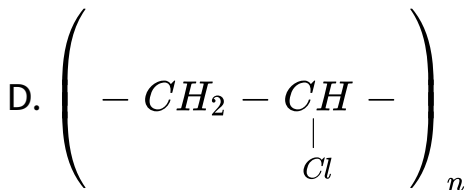
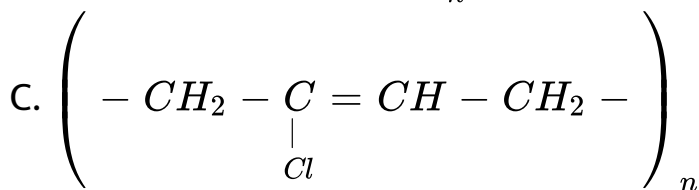
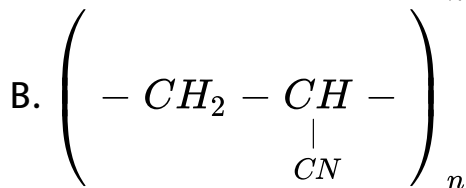
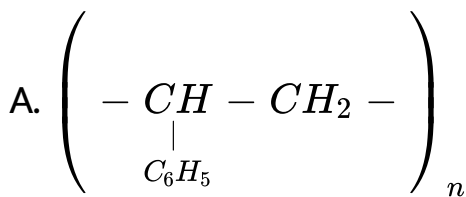
D. (A)-(iii), (B)-(i), (C)-(ii), (D) - (iv)

Answer: D



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8. Which one of the following structures represents the neoprene polymer?



Answer: C



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

- A. Polypropene
- B. Polyvinyl chloride
- C. Bakelite
- D. Glyptal

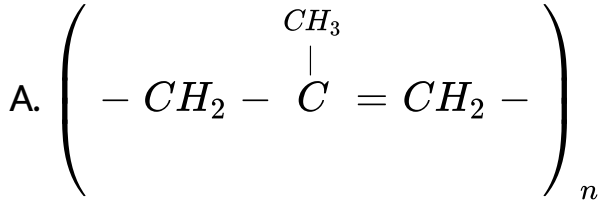
Answer: D



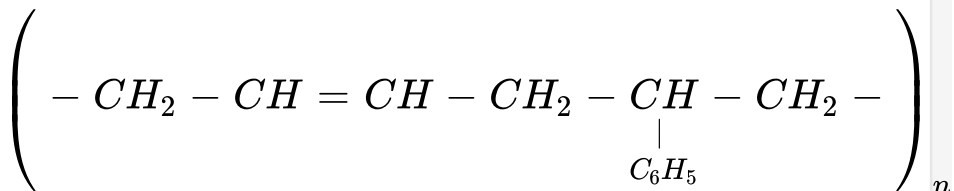
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10. Structure of some important polymers are given.

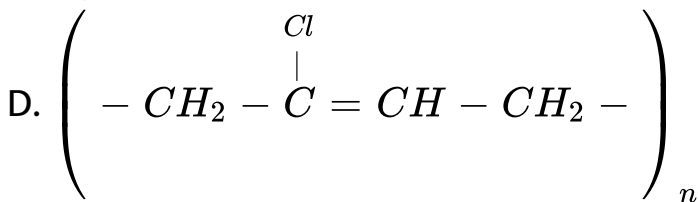
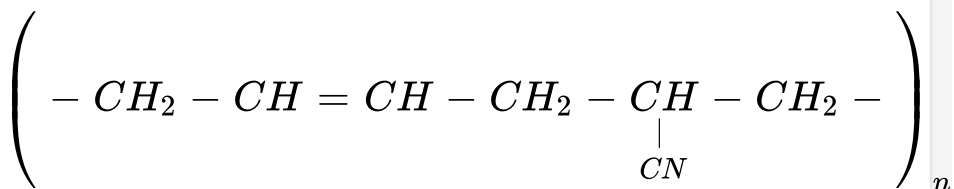
Which one represents Buna-S?



B.



C.



Answer: B



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11. Which one of the following is an example of thermosetting polymers?

A. Neoprene

B. Buna-N

C. Nylon 6,6

D. Bakelite

Answer: D



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Exercise 1 Concept Builder Topicwise

1. Among cellulose, poly (vinyl chloride), nylon and natural rubber, the polymer in which the intermolecular force of attraction is weakest is

A. Nylon

B. Polyvinyl chloride

C. Cellulose

D. Natural Rubber

Answer: D



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2. The process of heat-softening, moulding and cooling to rigidity can be repeated for

- A. thermoplastics
- B. thermosetting plastics
- C. Both (a) and (b)
- D. Neither (a) nor (b)

Answer: A



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3. Which of the following polymer is a polyamide?

A. Terylene

B. Nylon

C. Rubber

D. Vulcanised rubber

Answer: B



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4. Natural rubber is a polymer of

A. butadiene

B. isoprene

C. 2-methylbutadiene

D. hexa-1,3-diene

Answer: B



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5. $[NH(CH_2)_6NHCO(CH_2)_4CO]_n$ is a

- A. addition polymer
- B. thermosetting polymer
- C. homopolymer
- D. copolymer

Answer: D



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6. Ebonite is a

- A. natural rubber
- B. synthetic rubber
- C. highly vulcanized rubber
- D. polypropene

Answer: C



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

A. Polystyrene

B. Nylon

C. PVC

D. Polypropylene

Answer: B



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8. A condensation polymer among the following is:

A. dacron

B. PVC

C. polystyrene

D. teflon

Answer: A



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9. PVC is:

A. thermoplastic polymer

B. compound polymer

C. thermosetting polymer

D. simple polymer

Answer: A



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10. Synthetic polymer which resembles natural rubber is:

A. neoprene

B. chloroprene

C. glyptal

D. nylon

Answer: A



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

A. silk

B. dacron

C. nylon-6, 6

D. All of these

Answer: D



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12. Which of the following is not a biopolymer?

A. Proteins

B. Rubber

C. Cellulose

D. RNA

Answer: B



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13. Which is not an example of copolymer?

A. SAN

B. ABS

C. Saran

D. PVC

Answer: D



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14. In addition polymer monomer used is

A. unsaturated compounds

B. saturated compounds

C. bifunctional saturated compounds

D. tri functional saturated compounds

Answer: A



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15. Thermosets are:

A. cross-linked polymers

B. don't melt or soften on heating

C. cross-linking is usually developed at the time of moulding where they harden irreversibly

D. all of the above

Answer: D



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16. Three dimensional molecular structure with cross links are formed in the case of a

- A. thermoplastic
- B. thermosetting plastic
- C. Both (a) and (b)
- D. none of the above

Answer: B



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17. Which of the following statements is not correct for fibres?

- A. Fibres possess high tensile strength and high modulus.
- B. Fibres impart crystalline nature.
- C. Characteristic features of fibres are due to strong intermolecular forces like hydrogen bonding.
- D. All are correct

Answer: D



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18. Perlon is

A. Rubber

B. Nylon-6

C. Terylene

D. Orlon

Answer: B



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

A. Nucleic acid

B. Polystyrene

C. Protein

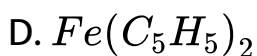
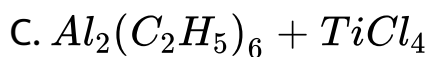
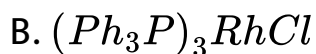
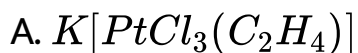
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Answer: B



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20. Ziegler-Natta catalyst is:



Answer: C

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21. Which pair of polymers have similar properties?

- A. Nylon, PVC
- B. PAN, PTFE
- C. PCTFE, PTFE
- D. Bakelite, alkyd resin

Answer: C

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22. The catalyst used in the manufacture of high density polyethylene is

A. Peroxide catalyst

B. Ziegler - Natta catalyst

C. Wilkinson's catalyst

D. Pd - catalyst

Answer: B



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23. Melamine plastic crockery is a condensation polymer of

- A. HCHO and melamine
- B. HCHO and ethylene
- C. melamine and ethylene
- D. None of these

Answer: A



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24. Which of the following polymers is synthesized using a free radical polymerization technique?

- A. Terylene
- B. Melamine polymer

C. Nylon 6,6

D. Teflon

Answer: D



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25. Synthetic polymer bakelite can be prepared from following compounds:-

A. Styrene and vinyl chloride

B. Acrylonitrile and vinyl chloride

C. Adipic acid and ethylene glycol

D. Phenol and formaldehyde

Answer: D



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26. For natural polymers PDI is generally

A. 0

B. 1

C. 100

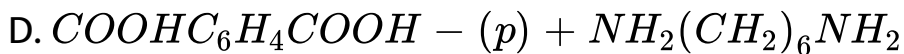
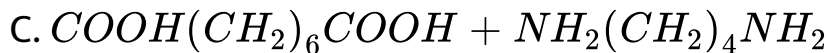
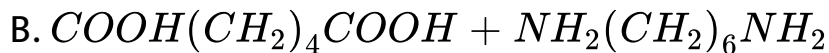
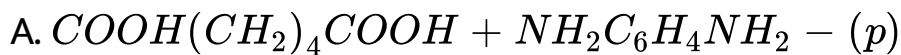
D. 1000

Answer: B



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27. Nylon - 6,6 is a polyamide obtained by the reaction of



Answer: B



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28. $\text{CF}_2 = \text{CF}_2$ is a unit of

A. teflon

B. buna-S

C. bakelite

D. polythene

Answer: A

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29. Monomer of $\left[\begin{array}{c} CH_3 \\ | \\ - C - CH_2 - \\ | \\ CH_3 \end{array} \right]_n$ is

A. 2-methylpropene

B. styrene

C. propylene

D. ethene

Answer: A



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30. Orlon is a polymer of

A. styrene

B. tetrafluoroethylene

C. vinyl chloride

D. acrylonitrile

Answer: D



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31. PVC is formed by polymerisation of

- A. ethene
- B. 1-chloropropene
- C. propene
- D. 1-chloroethene

Answer: D



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32. Caprolactum polymerises to give:

A. terylene

B. teflon

C. glyptal

D. nylon-6

Answer: D



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33. Interparticle forces present in nylon-66 are:

A. van der Waal's

B. hydrogen bonding

C. dipole-dipole interactions

D. none of these

Answer: B



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

A. galvanisation

B. vulcanization

C. bessemerisaion

D. sulphonation

Answer: B



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35. Which of the following polymers do not involve crosslinkages?

A. Melmac

B. Bakelite

C. Polythene

D. Vulcanised rubber

Answer: C



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36. Number average molecular mass, \overline{M}_n and weight average molecular mass (\overline{M}_w) of synthetic polymers are related as

A. $\overline{M}_n = (\overline{M}_w)^{1/2}$

B. $\overline{M}_n = \overline{M}_w$

C. $\overline{M}_w > \overline{M}_n$

D. $\overline{M}_w < \overline{M}_n$

Answer: C



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37. Select the correct statement

- A. Vinyon is a copolymer of vinyl chloride and vinyl acetate
- B. Saran is a copolymer of vinyl chloride and vinylidene chloride
- C. Butyl rubber is a copolymer of isobutylene and isoprene
- D. All of the above are correct

Answer: D



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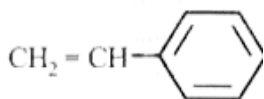
38. Low density polythene is prepared by

- A. Free radical polymerisation
- B. cationic polymerisation
- C. anionic polymerisation
- D. Ziegler-Natta polymerisation

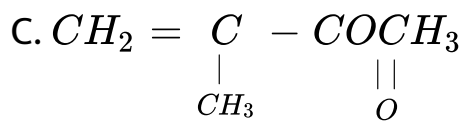
Answer: A

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39. Head-to-tail addition takes place in chain-growth polymerisation, when monomer is



B. $CH_2 = CH - CH = CH_2$



Answer: A

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40. Characteristic property of teflon is

- A. it has 2000 poise viscosity
- B. it has high surface tension
- C. it is non-inflammable and resistant to heat
- D. it is highly reactive

Answer: C



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41. The polymer used for optical lenses is

- A. polypropylene
- B. polyvinyl chloride
- C. polythene
- D. polymethyl methacrylate

Answer: D



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42. Polymer used in bullet proof glass is:

A. lexan

B. PMMA

C. nomex

D. kevlar

Answer: B



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43. Glyptals are chiefly employed in

A. toy making

- B. surface coating
- C. photofilm making
- D. electrical insulators

Answer: B



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44. Which polymer is used for making magnetic recording tapes?

- A. Dacron
- B. Acrilan
- C. Glyptal

D. Bakelite

Answer: D



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45. Isoprene is a valuable substance for making

A. propene

B. liquid fuel

C. synthetic rubber

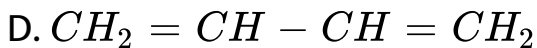
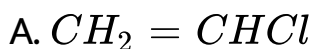
D. petrol

Answer: C



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46. The polymer used in making synthetic hair wigs is made up of



Answer: A



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47. Which of the following has been used in the manufacture of non-inflammable photographic films?

- A. Cellulose nitrate
- B. Cellulose xanthate
- C. Cellulose perchlorate
- D. Cellulose acetate

Answer: D



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48. Which of the following is currently used as a tyre cord?

A. Terylene

B. Polyethylene

C. Polypropylene

D. Nylon - 6

Answer: D



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49. PVC is used for the_____.

A. manufacture of cosmetics

B. manufacture of tyres

C. manufacture of nonstick pans

D. manufacture of plastic pipes

Answer: D

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50. The plastic household crockery is prepared by using

A. melamine and tetrafluoroethane

B. malonic acid and hexamethylenamine

C. melamine and vinyl acetate

D. metamine and formaldehyde

Answer: D

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Exercise 2 Concept Applicator

1. Nylon threads are made up of:

- A. polyester polymer
- B. polyamide polymer
- C. polyethylene polymer
- D. polyvinyl polymer

Answer: B



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2. A polymer made from a polymerization reaction that produces small molecules (such as water) as well as the polymer is classified as _____ polymer.

A. addition

B. natural

C. condensation

D. elimination

Answer: C



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3. Ethylene-propylene rubber (EPR) is

A. unsaturated and stereoregular

B. saturated and stereoregular

C. atactic and unsaturated

D. syndiotactic and unsaturated

Answer: B



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4. Synthetic polymer bakelite can be prepared from following compounds:-

A. Styrene and vinyl chloride

B. Acrylonitrile and vinyl chloride

C. Adipic acid and ethylene glycol

D. Phenol and formaldehyde

Answer: D

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5. If a polythene sample contains two monodisperse fractions in the ratio 2 : 3 with degree of polymerization 100 and 200, respectively, then its weight average molecular weight will be:

A. 4900

B. 4600

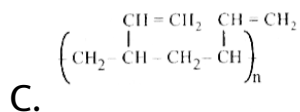
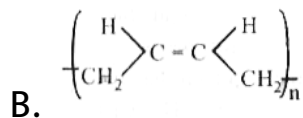
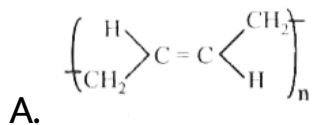
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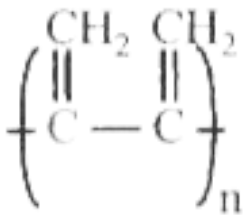
D. 5200

Answer: A

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6. Mark out the most unlike form of polymerization of
 $H_2C = CH - CH = CH_2$





D.

Answer: D

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7. The condensation of hexamethylenediamine with sebacoyl chloride at 525 K gives

A. nylon-6,20

B. nylon-6,01

C. nylon-6,10

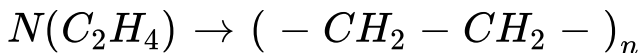
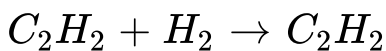
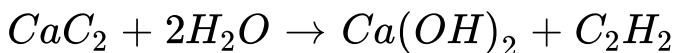
D. None of these

Answer: C



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8. Formation of polyethylene from calcium carbide takes place as follows



The amount of polyethylene obtained from $64.1\text{kg}CaC_2$ is

A. 7 kg

B. 14 kg

C. 21 kg

D. 28 kg

Answer: D



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9. Polymer formation from monomers starts by:

A. condensation or addition reaction between monomers

B. coordinate reaction between monomers

C. onversion of monomer to monomer ions

D. hydrolysis of monomers.

Answer: A



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10. Which of the following is fully fluorinated polymer?

A. PVC

B. Thiokol

C. Teflon

D. Neoprene

Answer: C



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11. Among the following the wrong statement is

- A. PMMA is plexiglass
- B. SBR is natural rubber
- C. PTFE is teflon
- D. LDPE is low density polythene

Answer: B



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

A. Bakelite

B. Teflon

C. Nylon-6, 6

D. Dacron

Answer: B



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13. Which is a polymer of three different monomers?

A. ABS

B. SBR

C. NBR

D. Nylon-2,6

Answer: A



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14. The polymer which has conducting power is

A. polyethylene

B. polybutadiene

C. polystyrene

D. polyacetylene

Answer: D



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15. Orlon is a -

A. homopolymer and addition polymer

B. copolymer and addition polymer

C. homopolymer and condensation polymer

D. copolymer and condensation polymer

Answer: A



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

- A. Step-growth polymer
- B. Synthetic fibre
- C. Condensation polymer
- D. Thermosetting plastic

Answer: D



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17. Vinyl chloride can be converted into PVC. In this reaction the catalyst used is _____.

- A. peroxides
- B. cuprous chloride
- C. anhydrous zinc chloride
- D. anhydrous $AlCl_3$

Answer: A



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18. The number average molecular mass and mass average molecular mass of a polymer are respectively

30,000 and 40,000. The poly dispersity of the polymer is:

A. < 1

B. > 1

C. 1

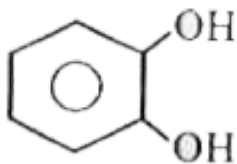
D. 0

Answer: B

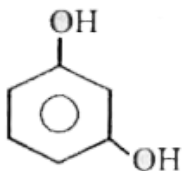


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19. The monomeric units of terylene are glycol and which of the following



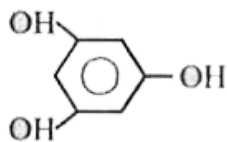
A.



B.



C.



D.

Answer: C



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20. Given th polymers,

$A = \text{Nylon-6,6}$, $B = \text{Buna-S}$, $C = \text{Polythene}$

Arrange these in decreasing order of their intermolecular forces:

A. (i) > (ii) > (iii)

B. (ii) > (iii) > (i)

C. (ii) < (iii) < (i)

D. (iii) < (i) < (ii)

Answer: C



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

- A. In vulcanization the formation of sulphur bridges between different chains make rubber harder and stronger.
- B. Natural rubber has the trans -configuration at every double bond
- C. Buna-S is a copolymer of butadiene and styrene
- D. Natural rubber is a 1,4 - polymer of isoprene

Answer: B



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22. The compound which cannot be used as a plasticizer, is

A. di-n-butylphthalate

B. tricresyl phosphate

C. di-n-octylphthalate

D. diethyl phthalate

Answer: D



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23. When condensation product of hexamethylenediamine and adipic acid is heated to

$553K(80^{\circ}C)$ in an atmosphere of nitrogen for about 4 – 5 hours, the product obtained is

- A. solid polymer of nylon 6,6
- B. liquid polymer of nylon 6,6
- C. gaseous polymer of nylon 6,6
- D. liquid polymer of nylon 6

Answer: B



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

A. Terylene

B. Bakelite

C. Melamine

D. Nylon-66

Answer: A



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

A. Melamine

B. Glyptal

C. Dacron

D. Neoprene

Answer: D



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26. Which of the following statements is false?

A. Artificial silk is derived from cellulose.

B. Nylon-6,6 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

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

A. PHBV

B. Buna -N

C. Nylon 6,6

D. Nylon -2- nylon 6

Answer: D



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29. Caprolactam, is used for the manufacture of

A. Nylon - 6

B. Teflon

C. Terylene

D. Nylon - 6,6

Answer: A



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30. Natural rubber has:

A. all cis-configuration

B. all trans-configuration

C. alternate cis-and trans-configuration

D. random cis-and trans-configuration

Answer: A



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