Polymers Important Questions With Answers

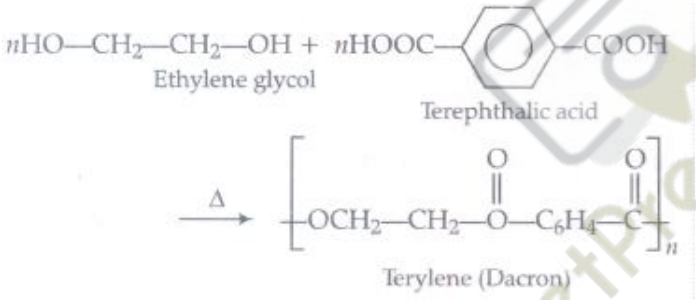
NEET Chemistry 2023

1. Regarding cross-linked or network polymers, which of the following statement is incorrect?
   a) Examples are bakelite and melamine b) They are formed from bi- and tri-functional monomers
   c) They contain covalent bonds between various linear polymer chains
   d) They contain strong covalent bonds in their polymer chains.

   Solution : -
   Cross-linked or network polymers are usually formed from bi-functional & tri-functional monomers and contains strong covalent bond between various linear polymer chains like Melamine, Bakelite etc.

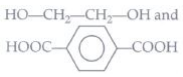
2. Which of the following organic compounds polymerized to form the polyester Dacron?
   a) Propylene and para HO—(C_6H_4)—OH b) Benzoicacid and ethanol
   c) Terephthalic acid and ethylene glycol d) Benzoic acid and para HO—(C_6H_4)—OH

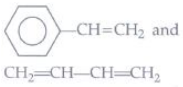
   Solution : -



3. Which of the following statements is false?
   a) Artificialsilk 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 celluloseare polymer of glucose.

   Solution : -
   Nylon 6, 6 is an example of fibers.

4. Which one of the following sets forms the biodegradable polymer?
   a) CH_2 == CH—CN and CH_2 == CN-CH == H_2N-CH_2-COOH and H_2N-(CH_2h-COOHCH$_2$
   b) $H_2N—CH_2—COOH$ and $H_2N—(CH_2)_5—COOH$ c) 

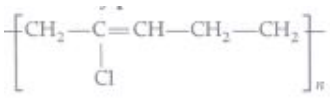
   d) 

   Solution : -
   Biodegradable polymer can be formed by $H_2N—CH_2—COOH$ and H_2N-$(CH_2)_5$—COOH.

5. Out of the following which one is classified as polyester polymer?
   a) Terylene b) Bakelit c) Melamine d) Nylon-6,6

   Solution : -
   Terylene (Dacron) is a polyester polymer.

6. Structures of some common polymers are given. Which one is not correctly presented?

a) Neoprene:  b) Terylene: 

c) Nylon 6,6:  d) Teflon:

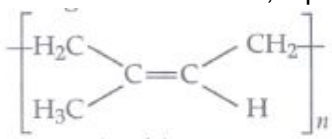
Solution : -

The structure  is of neoprene.

7. Which one of the following statements is not true?
   a) Buna-S is a copolymer of butadiene and styrene b) Natural rubber is a 1, 4-polymer of isoprene
   c) In vulcanization, the formation of sulphur bridges between different chains make rubber harder and stronger.
   d) Natural rubber has the trans-configuration at every double bond.

   Solution : -

   Natural rubber is cis-1, 3 polyisoprene and has only cis-configuration about the double bond.



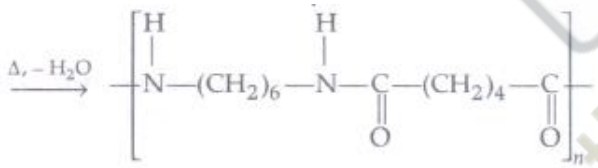
cis-polyisoprene
(Natural rubber)

8. Which one of the following polymers is prepared by condensation polymerisation?
   a) Teflon b) Natural rubber c) Styrene **d) Nylon-6, 6**

   Solution : -

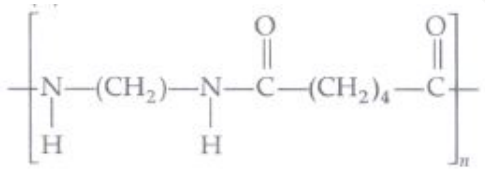
   Nylon 6, 6 is a condensation polymer. $nHOOC-(CH_2)_4-COOH + nH_2N-(CH_2)_6-NH_2$

   Adipic acid Hexamethylene diamine



9. ~~$[NH(CH_2)_6NHCO(CH_2)_4CO]_n$~~ is a :
   a) homopolymer **b) copolymer** c) addition polymer d) thermosetting polymer

   Solution : -



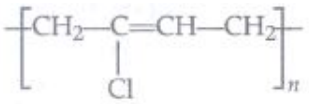
   is formed by the condensation of adipic acid and hexamethylenediamine. It is a copolymer.

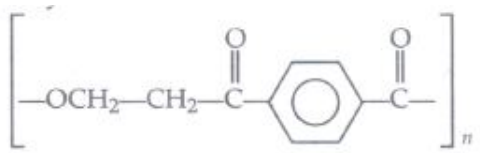
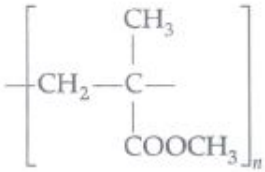
10. Cellulose is polymer of :
    a) glucose b) fructose c) ribose d) sucrose

    Solution : -

    Cellulose is a straight chain polysaccharide composed of D-glucose units joined by p-glycosidic linkage.

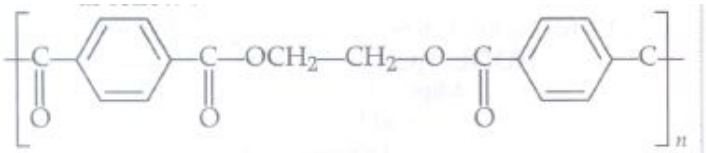
11. Which of the following is not correctly matched?

a) Neoprene :  b) Nylon-6,6 : 

c) Terylene :  d) PMMA : 

Solution : -

Chemically terylene (Dacron) is represented as follow:

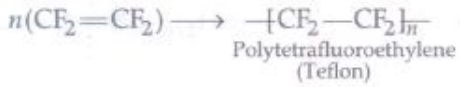


Terylene or Dacron

12. $CF_2=CF_2$ is monomer of :

a) teflon b) orlon c) polythene d) nylon-6

Solution : -



Polytetrafluoroethylene (Teflon)

13. Which compound form linear polymer due to H-bond?

a) H_2O b) NH_3 **c) HF** d) HCl

Solution : -

HF form linear polymer due to H-bonding.

H—F ... H—F ... H—F ... H—F

(Hydrogen bonding)

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

a) Poly-ethylene terephthalate **b) Polytetrafluoroethylene** c) PVC d) Polystyrene

Solution : -

Polytetrafluoroethylene or Teflon is a tough material, resistance to heat and bad conductor of electricity. It is used for coating the cookware to make them non-sticky.

15. The Bakelite is prepared by the reaction between :

a) phenol and formaldehyde b) tetramethylene glycol c) urea and formaldehyde d) ethylene glycol

Solution : -

Phenol and formaldehyde undergo condensation polymerisation under two different conditions to give a cross linked polymer called bakelite.

16. Match the column I with column II and mark the appropriate choice:

Column I		Column II	
(A)	Raincoats, hand bags	(i)	PHBV
(B)	Laminated sheets	(ii)	PVC
(C)	Television cabinets	(iii)	Urea-formaldehyde
(D)	Orthopaedic devices	(iv)	Polystyrene

a) (A) ⟶ (i), (B) ⟶ (ii), (C) ⟶ (iii), (D) ⟶ (iv) b) (A) ⟶ (iv), (B) ⟶ (i), (C) ⟶ (ii), (D) ⟶ (iii)

c) (A) ⟶ (ii), (B) ⟶ (iii), (C) ⟶ (iv), (D) ⟶ (i) **d) (A) ⟶ (iii), (B) ⟶ (iv), (C) ⟶ (i), (D) ⟶ (ii)**

17. Glycogen, a naturally occurring polymer stored in animals is a:

a) monosaccharide b) disaccharide c) trisaccharide **d) polysaccharide**

18. Identify the type of polymer.
(i) - A - A - A - A - A - A -
(ii) - A - B - B - A - A - A - B - A -
a) (i) Homopolymer, (ii) Copolymer b) (i) Natural polymer, (ii) Synthetic polymer
c) (i) Linear polymer, (ii) Branched polymer d) (i) Fibre, (ii) Elastomer

19. Which of the following is a homopolymer?
a) Bakelite b) Nylon 6, 6 **c) Neoprene** d) Buna-S

Solution : -
Neoprene is made up of single monomer species i.e., chloroprene.

20. Which of the following sets contain only addition homopolymers?
a) Polythene, natural rubber, cellulose b) Nylon, polyester, melamine resin c) Teflon, bakelite, orlon
d) Neoprene, PVC, polythene

Solution : -
Neoprene is made from chloroprene, PVC is from vinyl chloride and polyethene is from ethene monomer.

21. Teflon and neoprene are the examples of
a) copolymers b) monomers **c) homopolymers** d) condensation polymers

22. The S in buna-S refers to
a) sulphur **b) styrene** c) sodium d) salicylate

Solution : -
Butadiene + Styrene ⟶ Buna-S

23. Which factor imparts the crystalline nature to a polymer like nylon?
a) Strong intermolecular forces like hydrogen bonding between chains
b) van der Waals forces between the polymeric chains
c) Close packing of the chains due to ionic bonding between the chains
d) Three-dimensional network of chains

Solution : -
Strong intermolecular forces like hydrogen bonding lead to close packing of chains that impart crystalline character.

24. Arrange the following polymers in an increasing order of intermolecular forces; fibre, plastic, elastomer.
a) Elastomer < Fibre < Plastic **b) Elastomer < Plastic < Fibre** c) Plastic < Elastomer < Fibre
d) Fibre < Elastomer < Plastic

25. Which of the following is not true for thermoplastic polymers?
a) Thermoplastics are linear polymers **b) They soften and melt on heating**
c) Molten polymer can be remoulded into any shape d) They have cross-linkages which break on heating

Solution : -
Thermoplastics do not have any cross-linkages hence they are soft and can be remoulded after heating.

26. Which of the following are thermoplastic polymers?
a) Polythene, urea-formaldehyde, polyvinyls b) Bakelite, polythene, polystyrene
c) Polythene, polystyrene, polyvinyls d) Urea-formaldehyde, polystyrene, bakelite

27. Which of the following is not a characteristic of thermosetting polymers?

a) Linear or slightly branched long chain polymers b) Heavily branched and cross-linked polymers

c) Become infusible on moulding d) Cannot be remoulded or reused on heating

28. Bakelite is an example of

a) elastomer b) fibre c) thermoplastic **d) thermosetting**

Solution : -

Bakelite is a thermosetting polymers which is heavily cross-linked and cannot be softened or reused on heating.

29. Match the column I with column II and mark the appropriate choice.

Column I		Column II	
(A)	PVC	(i)	Rubber
(B)	Condensation polymer	(ii)	Thermoplastic
(C)	Polysaccharide	(iii)	Dacron
(D)	Elastomer	(iv)	Natural polymer

a) (A) ⟶ (ii), (B) ⟶ (iii), (C) ⟶ (iv), (D) ⟶ (i) b) (A) ⟶ (i), (B) ⟶ (ii), (C) ⟶ (iv), (D) ⟶ (iii)

c) (A) ⟶ (iii), (B) ⟶ (iv), (C) ⟶ (i), (D) ⟶ (ii) d) (A) ⟶ (iv), (B) ⟶ (i), (C) ⟶ (iii), (D) ⟶ (ii)

30. Match the column I with column II and mark the appropriate choice:

Column I		Column II	
(A)	Buna-S	(i)	Thermosetting
(B)	Polyamides	(ii)	Fibres
(C)	Polyvinyls	(iii)	Elastomer
(D)	Urea-formaldehyde	(iv)	Thermoplastics

a) (A) ⟶ (iv), (B) ⟶ (iii), (C) ⟶ (i), (D) ⟶ (ii) b) (A) ⟶ (ii), (B) ⟶ (i), (C) ⟶ (iii), (D) ⟶ (iv)

c) (A) ⟶ (iii), (B) ⟶ (ii), (C) ⟶ (iv), (D) ⟶ (i) d) (A) ⟶ (i), (B) ⟶ (iv), (C) ⟶ (ii), (D) ⟶ (iii)

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

a) Polythene b) Polystyrene c) Neoprene **d) Nylon 6,6**

Solution : -

Nylon 6, 6 is an example of condensation polymer.

32. Which of the following sets contains only addition polymers?

a) Polyethylene, polypropylene, terylene **b) Polyethylene, PVC, acrilan** c) Buna-S, nylon, polybutadiene

d) Bakelite, PVC, polyethylene

33. The monomers used in addition polymerisation through free radical should be very pure because

a) the traces of impurities act like inhibitors resulting in short chain polymers

b) the impurities result in formation of different products c) the polymer formed is impure

d) catalyst does not function in presence of impurities

34. Lowdensity polythene (LDP) is used in the insulation of electricity carrying wires and manufacture of flexible pipes and squeeze bottles because

a) it is tough, hard and rigid **b) it is chemically inert, tough, flexible and poor conductor of electricity**

c) it is very tough, good conductor of electricity and flexible

d) it is chemically inert, very soft, water absorbent and poor conductor of heat

35. High density polythene is obtained by

a) polymerisation of ethene in a hydrocarbon solvent in the presence of Ziegler-Natta catalyst

b) polymerisation of ethene under high pressure and temperature

c) free radical polymerisation of ethene at low temperature in presence of peroxide

d) polymerisation of ethene in presence of carbon tetrachloride

36. Which of the following is not true about high density polythene?
a) Tough b) Hard c) Inert **d) Highly branched**

Solution : -
High density polymer is not branched. It is made up of linear molecules which are closely packed.

37. The difference in the densities of low density (LDP) and high density polymers (HDP) is due to the fact that
a) LDP are highly branched structures while HDP consists of closely packed linear molecules

b) LDP are linear chains while HDP are branched chains of polythene

c) both LDP and HDP are unbranched linear chains with different lengths

d) at high temperature, the density of polymer is reduced

38. Composition of Ziegler- Natta catalyst is
a) $(Et_3)_3Al.TiCl_2$ b) $(Me)_3Al.TiCl_2$ **c) $(Et)_3Al.TiCl_4$** d) $(Et)_3Al.PtCl_4$

39. Which of the following polymers is not correctly matched?
a) Formation of dacron - Step growth polymerisation

b) Formation of polytetratluoroethene - Step growth polymerisation

c) Formation of polythene - Chain growth polymerisation in presence of benzoyl peroxide

d) Formation of polyacrylonitrile - Chain growth polymerisation in presence of peroxide

Solution : -
Polytetrafluoroethene (teflon) is a chain growth polymer formed by polymerisation of tetrafluoroethene in presence of persulphate catalyst.

40. Nylon 6, 6 is obtained by condensation polymerisation of
a) adipic acid and ethylene glycol **b) adipic acid and hexamethylenediamine**

c) terephthalic acid and ethylene glycol d) adipic acid and phenol

41. Which of the following is a condensation polymer?
a) Teflon b) PVC **c) Polyester** d) Neoprene

Solution : -
Polyester is a condensation polymer of glycol and terephthalic acid. Teflon, PVC and neoprene are the addition polymers.

42. Formation of nylons and polyesters are called step growth polymerisation because
a) the polymers are formed by adding a monomer step by step

b)
the polymers are formed by condensation and monomers are joined by loss of simple molecules like water

c) the monomers used for condensation are unsaturated molecules

d) the polymers are formed by addition of a large number of free radicals formed by monomers

43. Polymer which has amide linkage is:
a) nylon-6, 6 b) terylene c) teflon d) bakelite

44. Dacron is an example of
a) polyamides b) polypropenes c) polyacrylonitrile **d) polyesters**

Solution : -

Dacron is an example of polyesters.It is prepared by heating a mixture of ethylene glycoland terephthalic acid.

45. Which of the following polymers does not involve cross-linkages?
    a) Vulcanised rubber b) Bakelite c) Melamine **d) Teflon**

    Solution : -
    Teflon is an addition linear polymer of tetrafluoroethene.

46. Which among the following is a cross-linked polymer?
    a) Polyesters b) Glycogens **c) Melamine- formaldehyde** d) Polyvinyl chloride

47. Novolac on heating with formaldehyde undergoes _____ to form an infusible solid mass called _____.
    a) polymerisation, melamine b) vulcanisation, resin **c) cross-linking, bakelite**
    d) condensation, polystyrene

48. Which of the following is not an example of rubber?
    a) Polychloroprene b) Buna-N c) Butadiene-styrene copolymer **d) Polyacrylonitrile**

49. Heating rubber with sulphur is known as
    a) galvanisation b) bessemerisation **c) vulcanisation** d) sulphonation

50. In vulcanization of rubber
    a) sulphur reacts to form a new compound **b) sulphur cross-links are introduced**
    c) sulphur forms a very thin protective layer over rubber d) all statements are correct