

Date :

Marks :

TEST ID: XIICH1502

CHEMISTRY

## POLYMERS

### Single Correct Answer Type

31. Which of the following is thermoplastic?  
 a) Dacron                                      b) Nylon                                      c) Polythene                                      d) All of these
32. Thermosetting polymer, Bakelite is formed by the reaction of phenol with  
 a)  $\text{CH}_3\text{CH}_2\text{CHO}$                                       b)  $\text{CH}_3\text{CHO}$                                       c)  $\text{HCHO}$                                       d)  $\text{HCOOH}$
33. Which one of the following statement is wrong?  
 a) The IUPAC name of  $[\text{Co}(\text{NH}_3)_6\text{Cl}_3]$  is hexamine cobalt III chloride.  
 b) Dibenzol peroxide is a catalyst in the polymerization of PVC.  
 c) Borosilicate glass is heat resistant.  
 d) Concentrated  $\text{HNO}_3$  can be safely transported in aluminium containers.
34. Symbolic name for Teflon is:  
 a) PTFE                                      b) PCTFE                                      c) PVC                                      d) None of these
35. The condensation polymer is  
 a) Teflon                                      b) Polystyrene                                      c) Dacron                                      d) Neoprene
36. Which of the following is not an addition polymer?  
 a) Neoprene                                      b) Polystyrene                                      c) Terylene                                      d) Polyethylene
37. Which of the following pairs is not correctly matched?  
 a) Terylene-condensation polymer of terephthalic acid and ethylene glycol  
 b) Teflon-thermally stable cross linked polymer of phenol and formaldehyde  
 c) Perspex-a homopolymer of methyl methacrylate  
 d) Synthetic rubber-a copolymer of butadiene and styrene
38. Which among the following is step-growth polymer?  
 a) PTFE                                      b) PVC                                      c) Polyester                                      d) Polythene
39. Which one of the following is not a condensation polymer?  
 a) Dacron                                      b) Neoprene                                      c) Melamine                                      d) Glyptal
40. Teflon is:  
 a)  $\text{-(CF}_2\text{-CF}_2\text{)-}_n$                                       b)  $\text{-(CCl}_2\text{-CCl}_2\text{)-}_n$                                       c)  $\text{-(CF}_2\text{-CF}_2\text{)-}_n$                                       d)  $\text{CF}_2\text{Cl}_2$
41. An example of natural biopolymer is  
 a) Teflon                                      b) Nylon-66                                      c) Rubber                                      d) DNA
42. A polymer containing nitrogen is  
 a) Bakelite                                      b) Dacron                                      c) Rubber                                      d) Nylon-66
43. 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
44. Arrange the following monomers in order of decreasing ability to undergo cationic polymerisation  
 I.  $\text{NO}_2\text{C}_6\text{H}_5 - \text{CH} = \text{CH}_2$   
 II.  $\text{CH}_2 = \text{CH} - \text{C}_6\text{H}_5\text{CH}_3$   
 III.  $\text{CH}_2 = \text{CH} - \text{C}_6\text{H}_5\text{OCH}_3$   
 a) I>II>III                                      b) III>II>I                                      c) II>I>III                                      d) I>III>II
45. Which of the following alkenes is most reactive towards cationic polymerization?  
 a)  $\text{CH}_2 = \text{CHCH}_3$                                       b)  $\text{H}_2\text{C} = \text{CHCl}$                                       c)  $\text{H}_2\text{C} = \text{CHC}_6\text{H}_5$                                       d)  $\text{H}_2\text{C} = \text{CHCO}_2\text{CH}_3$
46. The product of addition polymerisation reaction is:  
 a) PVC                                      b) Nylon                                      c) Terylene                                      d) Polyamide
47. The polymer obtained by condensation of sebacic acid and hexamethylenediamine is named as

- a) Nylon-6                      b) Nylon-6-nylon-10                      c) Nylon-6,6                      d) Nylon-6,10
48. 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
49. Natural rubber is which type of polymer?  
 a) Condensation polymer                      b) Addition polymer  
 c) Coordination polymer                      d) None of these
50. PVC polymer can be prepared by which of the monomers?  
 a)  $\text{CH}_3\text{CH} = \text{CH}_2$                       b)  $\text{C}_6\text{H}_5\text{CH} = \text{CH}_2$                       c)  $\text{CH}_2 = \text{CH}_2$                       d)  $\text{CH}_2 = \text{CH} - \text{Cl}$
51. Which of the following is polycarbonate?  
 a) Acrilan                      b) Lexan                      c) NBR                      d) Runa-S
52. Which of the following has an ester linkage?  
 a) Nylon-6, 6                      b) Dacron                      c) PVC                      d) Bakelite
53. On the basis of their mode of formation, the polymers can be classified as  
 a) Addition polymers only                      b) Condensation polymers only  
 c) Copolymers                      d) Both addition and condensation polymers
54. Thermoplastics are:  
 a) Linear polymers  
 b) Soften or melt on heating  
 c) Molten polymer can be moulded in desired shape  
 d) All of the above
55. The starting materials of PCTFE are:  
 a) Monochlorotrifluoro ethylene  
 b) Tetrafluoroethylene  
 c) Vinyl chloride  
 d) Styrene
56. Nylon is not a  
 a) Condensation polymer                      b) Polyamide  
 c) Copolymer                      d) Homopolymer
57. Thiokol is a  
 a) fibre                      b) Plastic                      c) Rubber                      d) Monomer
58. Terylene is a polymer obtained from  
 a) Ethylene glycol and glycerol                      b) Ethylene glycol and glycerol aldehydes  
 c) Ethylene glycol and terephthalic acid                      d) None of the above
59. Which are true for terpolymer?  
 a) Contains three monomers  
 b) ABS plastic  
 c) A polymer of acrylonitrile, butadiene and styrene  
 d) All of the above
60. Protein is a polymer of:  
 a) Glucose                      b) Terephthalic acid                      c) Amino acids                      d) None of these

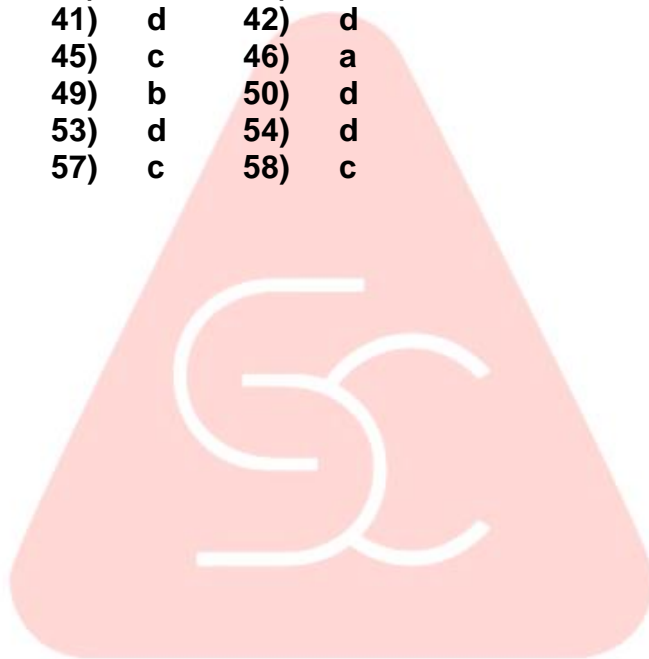
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## POLYMERS

### ANSWER KEY

31)	c	32)	c	33)	b	34)	a
35)	c	36)	c	37)	b	38)	c
39)	b	40)	a	41)	d	42)	d
43)	a	44)	b	45)	c	46)	a
47)	a	48)	b	49)	b	50)	d
51)	b	52)	b	53)	d	54)	d
55)	a	56)	d	57)	c	58)	c
59)	d	60)	c				



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## POLYMERS

### HINTS AND SOLUTIONS

32

(c)

Bakelite is a thermosetting plastic formed by reaction of phenol with HCHO in the presence of conc.  $H_2SO_4$ .



It is thus cross-linked polymer, condensation taking place at *o*- and *p*- positions.

Thus, HCHO.

33

(b)

Out of these statements, statement (b) is wrong.

34

(a)

Teflon is polymer of tetrafluoroethylene.

36

(c)

Addition polymers are obtained, when monomer contains multiple bond between carbon atoms. Terylene is a condensation polymer of ethylene glycol and terephthalic acid.



37

(b)

Teflon is a polymer of  $CF_2=CF_2$ .

39

(b)

Neoprene is addition polymer of chloroprene.

41

(d)

DNA is a natural biopolymer.

42

(d)

Nylon-6 6 is polymer of  $COOH-(CH_2)_4-COOH$  Adipic acid and  $H_2N-(CH_2)_6-NH_2$  (hexamethylenediamine)  
∴ Nylon-66 has nitrogen in it.

43

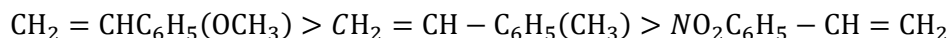
(a)

Cellulose acetate has been used in the manufacture of non inflammable pphotographic films.

44

(b)

Electron releasing groups such as  $CH_3$ ,  $-OCH_3$  activate the monomer towards cationic polymerisation as these groups provide stability to the carbocation formed. Thus, the correct order is



45

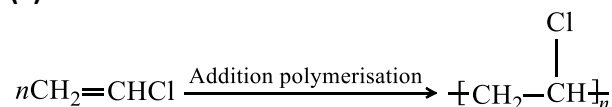
(c)

In cationic polymerization, carbocations are formed. Greater the stability of the carbocation, more reactive is the alkene. Since, the stability of the intermediate carbocation follows the order.

Therefore, reactivity decreases in the same order. Thus, styrene is most reactive.

46

(a)



This is PVC, a homopolymer.

47 (a)

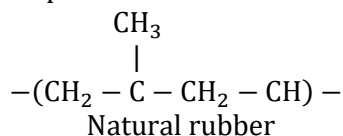
There are six carbon atoms in hexamethylenediamine and ten carbon atoms in sebacic acid, so the name of the nylon is nylon-6, 10. (Remember first the number of carbon atoms of amines are written).

48 (b)

SBR (styrene-butadiene) is a synthetic rubber.

49 (b)

Natural rubber obtained from plant named as *Heveabrasiliensis*. It is addition homopolymer of isoprene.



50 (d)

The monomer used for the preparation of PVC (Poly vinyl chloride) polymer is vinyl chloride. *i.e.*,  $\text{CH}_2 = \text{CH} - \text{Cl}$ .



51 (b)

Lexan is a polymer of diethyl carbonate and bisphenol-A.

52 (b)

When a diacid is condensed with dialcohol, the polymer obtained contains ester linkage.



53 (d)

Rayon, an artificial silk, contains long fibres of purified cellulose

54 (d)

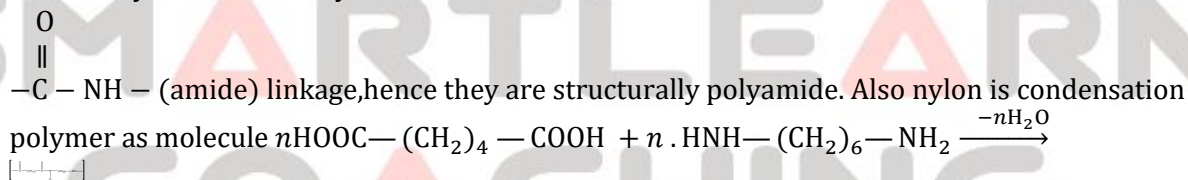
These are characteristics of thermoplastics.

55 (a)

PCTFE is polymer of chlorotrifluoro ethane.

56 (d)

Nylon is not homopolymer as it is a copolymer. The monomers of nylon-66 are adipic acid and hexamethylenediamine. Nylon contain

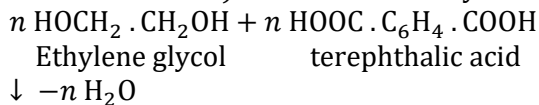


57 (c)

Thiokol is a synthetic rubber.

58 (c)

Ethylene glycol on reaction with terephthalic acid forms the polymer terylene (also known as Dacron or terene) which is used as synthetic fibre.



59 (d)

All are the characteristics and example of terpolymer.

60 (c)

Protein is a natural polymer of amino acids.



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