Date : **TEST ID: XIICH1502**
Marks : **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) CH_3CH_2CHO b) CH_3CHO c) HCHO d) HCOOH

33. Which one of the following statement is wrong?
a) The IUPAC name of $[Co(NH_3)_6Cl_3]$ is hexamine cobalt III chloride.
b) Dibenzol peroxide is a catalyst in the polymerization of PVC.
c) Borosilicate glass is heat resistant.
d) Concentrated 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) $+CBr_2-CBr_2+_n$ b) $+CCl_2-CCl_2+_n$ c) $+CF_2-CF_2+_n$ d) CF_2Cl_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. $NO_2C_6H_5 - CH = CH_2$
II. $CH_2 = CH - C_6H_5CH_3$
III. $CH_2 = CH - C_6H_5OCH_3$
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) $CH_2 = CHCH_3$ b) $H_2C = CHCl$ c) $H_2C = CHC_6H_5$ d) $H_2C = CHCO_2CH_3$

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 moment?
a) $CH_3CH = CH_2$ b) $C_6H_5CH = CH_2$ c) $CH_2 = CH_2$ d) $CH_2 = CH — Cl$

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 glyceraldehydes
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

Date :
Marks :

TEST ID: XIICH1502
CHEMISTRY

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				

Date : **TEST ID: XIICH1501**
Marks : **CHEMISTRY**

POLYMERS

HINTS AND SOLUTIONS

32 **(c)**
Bakelite is a thermosetting plastic formed by reaction of phenol with HCHOin 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 pohotographic 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

$$CH_2 = CHC_6H_5(OCH_3) > CH_2 = CH - C_6H_5(CH_3) > NO_2C_6H_5 - CH = CH_2$$

45 **(c)**
In cationic polymerization,carbocationsare 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)**

$$n CH_2{=}CHCl \xrightarrow{\text{Addition polymerisation}} \left[CH_2-\underset{Cl}{CH}\right]_n$$

This is PVC, a homopolymer.

47 **(a)**

There are six carbon atoms is 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.

$$-(CH_2 - \underset{\displaystyle CH_3}{\underset{|}{C}} = CH - CH_2)-$$

Natural rubber

50 **(d)**

The monomer used for the preparation of PVC (Poly vinyl chloride) polymer is vinyl chloride.*i.e.,* $CH_2 = CH - Cl$.

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 purificed 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

$-\overset{\displaystyle O}{\overset{\|}{C}} - NH -$ (amide) linkage,hence they are structurally polyamide. Also nylon is condensation polymer as molecule $n HOOC-(CH_2)_4-COOH + n.HNH-(CH_2)_6-NH_2 \xrightarrow{-nH_2O}$

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.

$n\ HOCH_2.CH_2OH + n\ HOOC.C_6H_4.COOH$

Ethylene glycol terephthalic acid

$\downarrow -n\ H_2O$

59 **(d)**

All are the characteristics and example of terpolymer.

60 **(c)**

Protein is a natural polymer of amino acids.