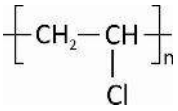
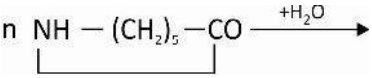
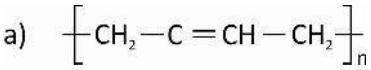
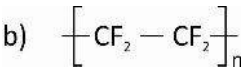
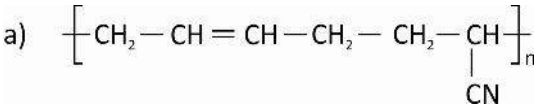
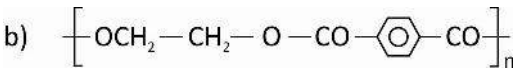
UNIT-15: POLYMERS

One mark questions:	
1. Based on the source, what type of polymer is rayon?	K
2. Arrange the following in the decreasing order of their intermolecular forces: Buna N, Polystyrene, Polyester	U
3. Mention one difference between thermoplastic and thermosetting polymer.	U
4. What must be the criteria for a monomer to form an addition polymer?	U
5. What is the most common mechanism suggested for addition polymerization?	U
6. What is the role of benzoyl peroxide in the polymerization of ethene?	K
7. Complete the chain propagation step: $C_6H_5\ CH_2{-}CH_2\bullet + CH_2 = CH_2 \longrightarrow$	K
8. Give reason : Polythene prepared under high pressure and temperature has low density.	U
9. Give the composition of Zeigler Natta catalyst?	K
10. Name the polymer that is resistant to attack by corrosive reagents and used in making non stick utensils.	A
11. Name the monomer for the polymer with a partial structure 	K
12. A saturated monomer has two different functional groups. What type of polymer is obtained from it?	U
13. What type of fibre can be formed by the polycondensation of dicarboxylic acids and diols?	U
14. Ethylene glycol is polymerised with terephthalic acid. Name the type of polymerization involved.	U
15.  a polymer. Name the polymer.	K
16. Unbreakable crockery is a copolymer of formaldehyde and nitrogen containing monomer. Name the monomer.	A
17. Is melamine polymer a cross linked or a branched polymer?	K
18. Rubber has elastic properties. Give reason.	U
19. What is the configuration at the carbon carbon double bond in natural rubber?	K
20. Name the element that helps cross linking of rubber molecules during Vulcanization.	K
21. Molecular mass of polymers are expressed as an average. Give reason.	U

22. Write the structure of the biodegradable co-polymer obtained using $NH_2–CH_2–COOH$ and $NH_2–(CH_2)_5–COOH$	K
23. Synthetic aliphatic polyesters are preferred over synthetic aromatic polyesters. Why?	U
Two mark questions:	
1. Name two semi synthetic polymers derived from cellulose.	K
2. Based on molecular forces polymers are classified. Name any two such class.	K
3. Based on structure what type of polymer is : a) urea - formaldehyde resin b) LDPE	K
4. How is an addition polymer formed? Write the structure of the addition polymer from styrene.	K
5. Asha uses a synthetic polymer which is a substitute for wool. What is the monomer used for such a polymer? Write the structure of the polymer.	A
6. Name the monomer for the polymers a)  b) 	U
7. What are the monomers required for the preparation of nylon 6,6?	K
8. Mention the type of polymerization reaction that occurs when these monomers are polymerized. a) $CF_2 = CF_2$ b) Caprolactum	K
9. Write an equation for the preparation of nylon 6.	K
10. Name a a) polyester b) polyamide fibre	K
11. Handles of utensils are made by a thermosetting polymer. Name the polymer, write its structure.	K
12. Identify the monomers for these polymeric structures. a)  b) 	U
13. Give two differences between natural rubber and Buna – S.	U
14. Give one example each for a synthetic biodegradable polymer that is a a) polyester b) polyamide	K
Three mark questions:	
1) Based on various types of classification of polymers, mention any three class that polyvinylchloride belongs to.	U

2) Write the steps involved in the free radical mechanism of the polymerization of ethene. U

3) Classify the given polymers as ; a) addition b) condensation c) network polymers

i) Dacron ii) Bakelite iii) Neoprene K

4) Distinguish LDPE & HDPE based on

i) method of preparation ii) structure iii) toughness/use K

5) With one example for each, distinguish chain-growth and step-growth polymerization. U

6) Match the items in A, B and C correctly

A	B	C
a) Bakelite	x) Condensation	p) Elastomer
b) Nylon – 6	y) Addition	q) Thermosetting
c) Buna – N	z) Homopolymer	r) Fibre

U

7) Give one example each of a synthetic polymer that is used as:

a) fibre b) elastomer c) plastic A

Five mark questions:

1) With respect to the monomer styrene :

i) Write the structure of its homo polymer.

ii) Name the polymer obtained when it is polymerized with 1,3 – butadiene.

iii) What characteristic property will the polymer in (ii) get? Mention one use of it

iv) If the homo polymer has 60% chains of molar mass 10000 each, 30% chains of molar mass 12000 each and 10% chains of molar mass 16000 each, what will be the molar mass of the polymer? U

2) a) Correct the underlined part in the following statements suitably:

i) Terylene is a <u>polyamide</u> fibre

ii) Cellulose <u>nitrate</u> is rayon.

iii) Many <u>synthetic</u> polymers are biodegradable.

b) Write the structures of the monomer for the polymers

i) Nylon-6 ii) Polystyrene

3) a) Which of the following is an elastomer, polyamide, thermosetting polymer? K

i) Urea – formaldehyde ii) Neoprene iii) Nylon – 6

b) Write any two advantages in the Vulcanization of rubber.

4) a) How is a homopolymer different from a copolymer? K

b) Write the names of the polymer obtained from

		i) $CH_2 = CHCN$ ii) Ethylene glycol and terephthalic acid	
	c)	Write the equation for the polymerization of chloroprene to get neoprene.	
5)	a)	Write any two differences between Nylon 6 and Nylon 2 - Nylon 6.	K
	b)	Complete the following polymerization reactions:	
		i) $nCH_2=CH-CH=CH_2 + nCH_2=\underset{\displaystyle C_6H_5}{\overset{\displaystyle |}{CH}} \xrightarrow[\text{catalyst}]{\text{peroxide}}$	
		ii) $n\ \underset{\displaystyle \llcorner\!\!\lrcorner}{NH-(CH_2)_5-CO} \xrightarrow{+H_2O}$	
		iii) $n\left[CH_2=\underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}-CH=CH_2\right] \longrightarrow$	K
6)	a)	n  $+ mHCHO \xrightarrow{H^+} \underset{\text{linear polymer}}{P} \xrightarrow{HCHO,\ heat} \underset{\text{cross linked polymer}}{Q}$	
		Name P and Q. Give one use of P.	
	b)	Give reason : i) Fibre has close packing of chains and crystalline nature.	
		ii) Polythene prepared using Zeigler Natta catalyst has high density.	U
7)	a)	A polymer is as shown below:	
			
		Based on the structure what type of polymer is it? Give one example for such a polymer.	
	b)	Name a polymer each with the following characteristic and use :	
		i) crease resistant hence used to blend with cotton & wool.	
		ii) resistant to attack by petrol and other organic solvents and used for tank lining.	
		iii) Resistant to chemicals, insects and fungi and used in making fibers such as orlon.	A