INDIAN SCHOOL AL WADI AL KABIR

Class: XII	**DEPARTMENT: SCIENCE 2020 - 2021** **SUBJECT : CHEMISTRY**	**Date of completion :** **III week of June, 2020**
Worksheet No:04 **With answers**	**TOPIC : POLYMERS**	**Note:** **A4 FILE FORMAT**
NAME OF THE STUDENT	**CLASS & SEC:**	**ROLL NO.**

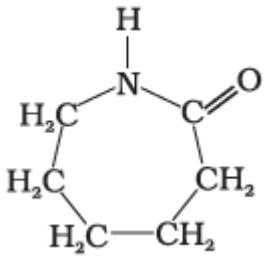
MULTIPLE CHOICE QUESTIONS

1. Which of the following statements is not true about low density polythene?

i) Tough ii) Flexible

iii) Poor conductor of electricity iv) Linear structure

2. Which of the following polymer can be formed by using the following monomer unit?



i) Nylon 2–nylon 6 ii) Teflon

iii) Nylon 6,6 iv) Nylon 6

3. Name the polymer which is used in the Manufacture of paints and lacquers.

i) Polystyrene ii) Bakelite

iii) Glyptal iv) Polypropene

4. Which element is used in the Vulcanisation of rubber?

i) Oxygen ii) Sulphur

iii) Chlorine iv) Bromine

5. Natural rubber may be considered as a linear polymer of ……

i) Acrylonitrile ii) Isoprene

iii) Neoprene iv) Styrene

6. High density polythene is formed by the addition polymerisation of ethene in presence of

i) Ziegler-Natta catalyst ii) Ni catalyst

iii) Fe catalyst iv) V_2O_5 catalyst

7. Which of the following is a Thermosetting polymer?

i) Bakelite ii) Polythene

iii) Polystyrene iv) Buna-S

Assertion Reason Type

a. Both Assertion and Reason are correct statements, and Reason is the correct explanation of the Assertion.

b. Both Assertion and Reason are correct statements, but Reason is not the correct explanation of the Assertion.

c. Assertion is correct but Reason is wrong statement.

d. Assertion is wrong but Reason is correct statement.

8. **Assertion** : Most of the Synthetic polymers are not biodegradable.
Reason : Polymerisation process induces toxic character in organic molecules.

9. **Assertion** : For making rubber synthetically, isoprene molecules are polymerised.
Reason : Neoprene (a polymer of chloroprene) is a synthetic rubber.

10. **Assertion** : Network polymers are thermosetting.
Reason : Network polymers have high molecular mass.

Read the given passage and answer the questions that follow:

Elastomers are rubber – like solids with elastic properties. In these polymers, chains are held together by the weakest intermolecular forces. These weak binding forces permit the polymer to be stretched. A few 'crosslinks' are introduced in between the chains, which help the polymer to retract to its original position after the force is released as in vulcanised rubber.

11. Write any two examples for elastomers.

12. Draw the structure of the monomer of natural rubber.

13. Is Neoprene a natural or synthetic rubber?

14. Write any one use of Neoprene.

15. Why is vulcanisation carried out?

Question – Answer Type:

16. Differentiate between addition and condensation polymerisation. (1)

17. Is Teflon a homopolymer or a copolymer? (1)

18. What are Biodegradable polymers? (1)

19. Classify the following as addition and condensation polymers: (1)

Terylene, Bakelite, Polyvinyl chloride, Polythene.

20. Arrange the following polymers in increasing order of their intermolecular forces. (1)

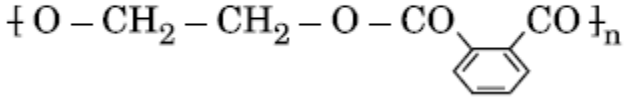
Nylon 6,6, Buna-S, Polythene.

21. Name the monomers of Nylon 2–nylon 6 (1)

22. Write any two uses of polypropene. (1)

23. Write one structural difference between low density polythene and high density polythene. (1)

24. Write the monomers of the following polymer :



(1)

25. (i) Name the polymer which is biodegradable. Write the structures of monomers and the repeating unit. (2)

(ii) Write two uses of this polymer

26. Write the names and structures of the monomers of the following polymers : (2)

(a) Terylene

(b) Teflon

27. Classify the following as addition and condensation polymers giving reason : (2)

(a) Buna – N

(b) PHBV

28. (a) Is $\{CH_2 - CH(C_6H_5)\}_n$ a homopolymer or copolymer ? Give reason.

(b) Write the monomers of the following polymer :

$$\{O - \underset{\underset{CH_3}{|}}{CH} - CH_2 - \underset{\underset{O}{||}}{C} - O - \underset{\underset{C_2H_5}{|}}{CH} - CH_2 - \underset{\underset{O}{||}}{C}\}_n$$

(c) Write the role of benzoyl peroxide in polymerisation of ethene. (3)

29. Write the structures of monomers used for getting the following polymers : (3)

(i) Nylon-6,6

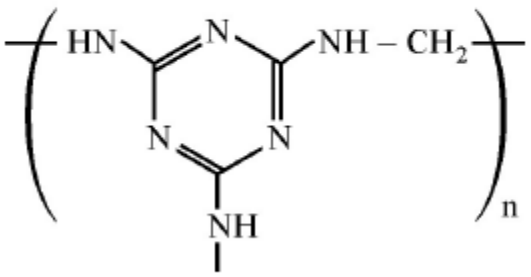
(ii) Glyptal

(iii) Buna-S

30.

(i) Is $\{CH_2 - \underset{\underset{CH_3}{|}}{CH}\}_n$ a homopolymer or copolymer ? Give reason.

(ii) Write the monomers of the following polymer :

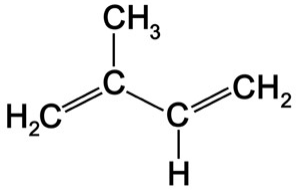


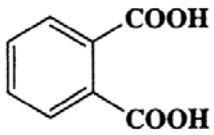
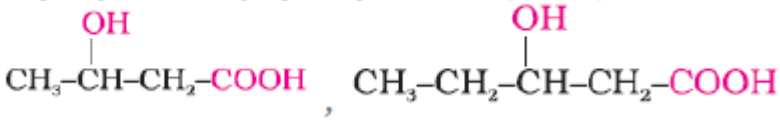
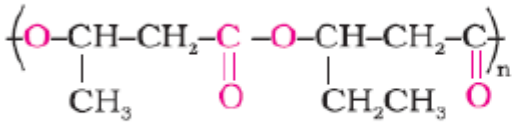
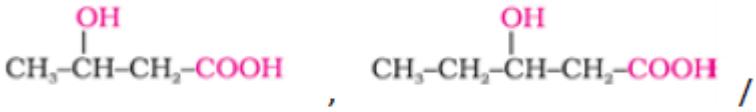
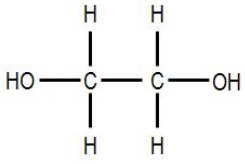
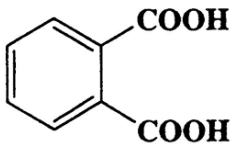
(iii) What is the role of Sulphur in vulcanization of rubber ? (3)

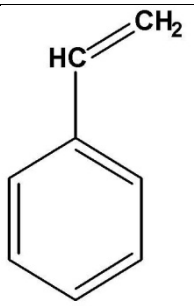
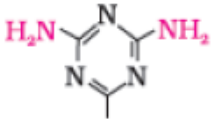
ANSWERS

1	**iv**
2	**iv**
3	**iii**
4	**ii**
5	**ii**

6	**i**
7	**i**
8	**c**
9	**d**
10	**b**

11	Buna-S, Buna-N, Neoprene (Any two)
12	
13	Synthetic rubber
14	It is used for manufacturing conveyor belts, gaskets and hoses (Any one)
15	Natural rubber is soluble in non-polar solvents and is non-resistant to attack by oxidising agents. To improve upon these physical properties, vulcanisation is carried out.
16	The addition polymers are formed by the repeated addition of monomer molecules possessing double or triple bonds. The condensation polymers are formed by repeated condensation reaction between two different bi-functional or tri-functional monomeric units.
17	Homopolymer
18	Polymers that can be degraded by bacteria and they contain functional groups similar to the functional groups present in biopolymers. Eg:- PHBV
19	Addition polymers - Polyvinyl chloride, Polythene Condensation polymers - Terylene, Bakelite
20	Buna-S < Polythene < Nylon 6,6
21	Glycine ($H_2N–CH_2–COOH$) and Amino caproic acid [$H_2N\ (CH_2)_5\ COOH$]

22	Manufacture of ropes, toys, pipes, fibres, etc.
23	Low density polythene is highly branched while high density polythene is linear.
24	Ethylene glycol and phthalic acid / $HO\text{-}CH_2\text{-}CH_2\text{-}OH$ and 
25	a) *Poly β-hydroxybutyrate – co-β-hydroxyvalerate / (PHBV)* *Monomers :*  *Repeating unit :*  *b)* PHBV is used in speciality packaging, orthopaedic devices and in controlled release of drugs.(any two)
26	a. Ethylene Glycol and Terephthalic acid $HOH_2C\text{-}CH_2OH$, $p\text{-}HOOC\text{-}C_6H_4\text{-}COOH$ b. Tetrafluoroethene , $CF_2=CF_2$
27	(a) Addition polymer; formed by addition of monomers / unsaturated monomeric units (b) Condensation polymer; formed by condensation of bifunctional monomers with elimination of water molecules
28	a) Homopolymer ; As the same monomer is repeated. b)  3-Hydroxybutanoic acid , 3-Hydroxypentanoic acid c) It acts as an initiator.
29	i. $NH_2\ (CH_2)_6\ NH_2$ and $HOOC\ (CH_2)_4\ COOH$ ii.  and 

	iii.  $CH_2 = CH - CH = CH_2$ and
30	i) Homopolymers , single repeating unit  ii) , HCHO (Or names of monomers) iii) Sulphur forms cross links at the reactive sites of double bonds and thus the rubber gets stiffened / To improve the physical properties of rubber by forming cross links.

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