HW06 - Plastics & Polymers

Question 1 6 pts

Which step of the addition mechanism both increases the length of the polymer chain AND produces a free radical to continue the reaction?

- addition
- perpetuation
- termination
- initiation
- propagation

Question 2 6 pts

Which of the following properly outlines the addition mechanism?

- Initiation - Propagation - Termination
- Initiation - Termination - Propagation
- Initiation - Propagation - Condensation - Termination
- Heterolytic Cleavage - Propagation - Condensation - Termination

Question 3 6 pts

A condensation reaction may occur when which two functional groups are present in the reactants?

- carboxylic acid, alcohol
- amine, carboxylic acid
- ketone, alcohol
- alcohol, ester
- aldehyde, ether

Question 4 6 pts

Which recycle symbol (number) would you most likely find on a large milk container made from the following monomer:

- 1
- 6
- 2
- 5
- 4

Question 5 6 pts

LDPE polymers are _____ branched than HDPE, resulting in greater _____.

- more, flexibility
- less, strength
- more, strength
- less, flexibility

Question 6 6 pts

Observe the structure below and answer the next two questions.

Which arrow is pointing to a carbonyl carbon?

- B
- C
- A
- D

Question 7 6 pts

On this same structure, which group will be **removed** in the condensation mechanism?

- B
- A
- D
- C

Question 8 6 pts

Fabrics often list their contents in generic terms, rather than proprietary ones. What might you find on the care tag of a nylon garment?

- silk
- Kevlar
- polyamide
- polystyrene
- polyester

Question 9 4 pts

Which of the following polymers are made via an addition reaction mechanism?

- Polyvinyl Chloride
- Polypropylene
- Polystyrene
- Nylon
- Polyethylene
- Bakelite
- Polyethylene Terephthalate

Question 10 6 pts

Five of the six "Big 6" plastics are composed of nearly the same repeating monomer, but with differing functional groups substituted into a single position. What is the functional group unique to polypropylene?

- methyl
- halide
- carbonyl
- alcohol
- amine

Question 11 6 pts

Which of the following functional groups is the distinguishing feature of the monomer used to manufacture styrofoam?

- a halide group
- an amine group
- a phenyl group
- a ester group
- a benzyl group

Question 12 6 pts

The following three common plastic items are most likely to be composed of which three Big 6 plastics? (identify the plastics by their recycling number)

- Disposable coffee cup
- Plumbing pipe
- Carbonated drink bottle

- 5, 2, 3
- 6, 3, 1
- 2, 4, 6
- 3, 1, 4

Question 13 6 pts

The bakelite polymer consists of phenol and formaldehyde. In the real world, why does this polymer **not** look as organized as it does in two dimensions?

- the phenol groups are flat
- the methylene links can rotate and branch in different directions
- the carbon-carbon bonds in the phenol groups can rotate and branch in different directions
- the methylene links are flat and rigid

Question 14 6 pts

Which of the following is/are made from amino acid monomers?

- silk
- starch
- cellulose
- fats
- wool
- biological proteins

Question 15 6 pts

Which of the following can be glucose polymers?

- carbohydrates
- flax
- proteins
- cotton
- silk
- wool

Question 16 6 pts

There are many different types of proteins. What makes a protein unique?

- the fact that all amino acids have the same functional groups
- the carboxylic acid and amine functional groups on the amino acid monomers
- the identity of the R-side chain on the amino acid monomers that make up the polymer
- the various sugar monomers that make up the protein chain

Question 17 6 pts

Consider the biological polymer of DNA. There are two monomer units (a copolymer) that make up the backbone chain - what is the repeat unit here?

- peptide link + ribose
- ester + deoxyribose
- phosphate + deoxyfructose
- phosphate + deoxyribose
- phosphate + glucose