3-RD COURSE MIXING **SURNAME NAME GROUP**

TASK 1. MATCH THE DEFINITIONS.

Dispersion:	The process of combining two or more substances or materials together to create a homogeneous mixture, often achieved through mechanical agitation, stirring, or blending, to achieve desired properties or characteristics in the final product.
Agitation:	Distributing particles or droplets of one substance throughout another substance, often achieved through mixing and agitation.
Mixing:	Applying mechanical force or energy to a mixture to facilitate mixing, dispersion, or emulsification.

TASK 2. SOLVE THE CROSSWORD.

Mixing chamber **Liquid medium** **Blade mixer** **Components**
Unit operation **Mechanical energy** **Power consumption**
Heat transfer **Shear forces** **Dispersion**
Convective flow **Final product**

ACROSS:

1. a substance that is in liquid form and is used as a medium in mixing processes.
2. It is a distinct step or process within a larger operation.
3. A space or container where various substances are combined or blended together to create a uniform mixture.
4. The result of a mixing process.
5. Energy generated by the movement of mechanical components.

DOWN:

6. Process of spreading components evenly throughout a mixture.
7. Movement of fluid caused by temperature differences.
8. Equipment used to blend components together.
9. Forces that act parallel to each other, affecting the stability of a mixture.
10. Transfer of thermal energy between substances.
11. Measurement of the amount of energy used during mixing.

TASK 3. MATCH THE QUESTIONS (1-7) WITH THE APPROPRIATE RESPONSE (A-G).

1. _____What is the primary objective of mixing as described in the text?
2. _____How does mixing contribute to the reduction of nonuniformity in a system?
3. _____What equipment is typically used to carry out mixing operations?
4. _____What are the ultimate pieces into which components of a system are ideally dispersed during mixing?
5. _____How does mixing promote mass and heat transfer, as well as chemical reactions?
6. _____Why is evaluating the degree of mixing critical for assessing and controlling process performance and product quality?
7. _____How do large interfacial areas between components influence the efficiency of mixing processes?

a) *Mixing is typically carried out in equipment known as mixers.*
b) *The primary objective of mixing, as described in the text, is to reduce the degree of nonuniformity of all properties of a system, single or multiphase, with one or many components.*
c) *Large interfacial areas between components influence the efficiency of mixing processes by promoting mass and heat transfer as well as chemical reactions.*
d) *Mixing promotes mass and heat transfer as well as chemical reactions by creating large interfacial areas between the components of a mixture.*
e) *Evaluating the degree of mixing is critical for assessing and controlling process performance and ensuring product quality.*
f) *The ultimate pieces into which components of a system are ideally dispersed during mixing may vary depending on the nature of the components and phases of the system. They could be the size of a molecule, a drop, a bubble, or a particle.*
g) *Mixing contributes to the reduction of nonuniformity in a system by rearranging its components into a state where they are ideally uniformly distributed throughout the system and completely dispersed to their ultimate, smallest pieces.*

TASK 4. FILL IN THE GAPS WITH THE MOST SUITABLE WORD FROM THE BOX.

FINAL PRODUCTS / DISPERSING / PRODUCT QUALITY / CONSISTENCY / UNIFORMITY / REDUCE / HOMOGENEOUS / HEAT TRANSFER / DEGREE OF MIXING

- Mixing is a crucial process in various industries, involving the thorough blending of components to achieve_____ and consistency in properties throughout the mixture.
- The primary goal of mixing is to _____ nonuniformity within a system by _____ its components into smaller, evenly distributed pieces, promoting efficient mass and _____ as well as chemical reactions.
- Through mixing, raw materials are transformed into _____ blends, ensuring the desired quality and characteristics of the _____.
- Whether in food processing, pharmaceuticals, or manufacturing, the importance of mixing cannot be overstated, as it directly impacts the performance, quality, and _____ of end products.
- Evaluating the _____ achieved is critical for optimizing process performance, controlling _____, and meeting industry standards and regulations.

TASK 5. PUT THE STAGES OF THE MIXING PROCESS IN THE CORRECT ORDER.

_____Activate the blade mixer to initiate the mixing process. The mechanical energy generated by the mixer will induce convective flow within the mixture, promoting the dispersion of components.

_____Introduce the emulsifiers into the mixture to facilitate the dispersion of oil and water phases.

_____Add the liquid medium, consisting of water and oils, into the mixing chamber.

_____Gradually incorporate the fragrance into the mixture to ensure even distribution.

_____Continuously assess the temperature within the mixing chamber to ensure optimal heat transfer throughout the process.

_____Monitor the shear forces exerted on the mixture to prevent excessive agitation, which could affect the stability of the emulsion.

_____Adjust the power consumption of the mixer as needed to maintain efficient mixing without excessive energy consumption.

_____Begin by setting up the mixing chamber and ensuring all equipment is properly calibrated.

_____Once the desired homogeneity is achieved, stop the mixer and transfer the final product for further processing or packaging.