

**ASSIGNMENT#1**  
**BT604: INDUSTRIAL BIOTECHNOLOGY**

**Spring 2022**

**Solution:**

**Question No. 1**

- a) Define Fermentation. How can you outline a fermentation process depicting up streaming and down streaming processing?**

**Answer:**

Fermentations is a process in which substrate is converted into products are achieved under very controlled process. The main motive behind running this process to achieved products in bulks quantity without compromising on quality. Fermentation process is performed in large fermenters which is design according industrial process. Fermentations process is widely used in food industry.

**Up streaming and Down streaming processing:**

Upstream fermentation process of fermentation is the stage of fermentation when substrate begin to produced product. So, it is the stage from the beginning until product is formed.

The Up streaming process includes collection of raw materials, putting raw materials into the fermenter, preparation of microorganisms like bacteria and fungi that is required for the fermentation process and then transferring of microorganisms into the fermenter.

**Downstream Fermentations:**

Downstream Fermentation process is the collection, testing, packaging and labelling of the products untill it is made available in market for consumers and other trading purposes.