

## JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- Feb 2018

B.Tech VI Semester

COURSE CODE: 16B11BT611

MAX. MARKS: 15

COURSE NAME: Downstream Processing

COURSE CREDITS: 04

MAX. TIME: 1 Hr.

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

1. Why the less number of passes through the homogeniser is generally preferred? [1]
2. How a downstream processing is different from an upstream processing process? [2]
3. How does the use of filter aid improve the filtration? [2]
4. Why salt induced precipitation is carried out at low temperature usually at 4°C? [2]
5. Tubular-bowl centrifuge is used to concentrate a suspension of genetically-engineered yeast containing a new recombinant protein. At a speed of 12,000 rpm, the centrifuge treats 3 litre broth  $\text{min}^{-1}$  with satisfactory results. It is proposed to use the same centrifuge to separate cell debris from homogenate produced by mechanical disruption of the yeast. If the average size of the debris is one-third that of the yeast and the viscosity of the homogenate is five times greater than the cell suspension, what flow rate can be handled if the centrifuge is operated at the same speed? [2]
6. How the permeability coefficient of the cake and the viscosity of the fluid affect the rate of filtration? [3]
7. A 30-ml sample of broth from a penicillin fermentation is filtered in the laboratory on a 3  $\text{cm}^2$  filter at a pressure drop of 5 psi. The filtration time is 4.5 min. Previous studies have shown that filter cake of *Penicillium chrysogenum* is significantly compressible with  $s = 0.5$ . If 500 litres broth from a pilot-scale fermenter must be filtered in 1 hour, what size filter is required if the pressure drop is 10 psi? [3]