Registration No : | | | | | | | | | | |

Total Number of Page : 01 **B.Tech.**
PCBT4306

6th Semester Back Examination 2017-18
DOWNSTREAM PROCESS ENGINEERING
BRANCH : BIOTECH
Time : 3 Hours
Max Marks : 70
Q.CODE : C484

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.
Answer all parts of a question at a place.

Q1. **Answer the following questions :** **(2 x 10)**

a) Write the importance of downstream process steps in bioprocessing? Differentiate between sedimentation and precipitation.
b) Explicate the role of dialysis in a protein separation process.
c) Define the term filtration.
d) Distinguish between adsorption and absorption.
e) Explain the role of drying curve in bioprocessing.
f) Write any two detergents that help in cell disruption?
g) Write the principle of sonication.
h) What are the different types of chromatography techniques?
i) Differentiate between normal and reverse phase chromatography.
j) What is salting out? How it is different from salting in?

Q2. **a)** Explain about different the enzymatic methods that help in cell disruption. **(5)**
b) Write a note on microfiltration. **(5)**

Q3. **a)** Explain in detail about ultrafiltration. **(5)**
b) Write in detail about the aqueous two-phase extraction process **(5)**

Q4. **a)** Explain the principle and working of TLC. **(5)**
b) Describe the membrane based separation process. **(5)**

Q5. **a)** Write the principle behind crystallization. **(5)**
b) Describe the different types of physical methods that are used in cell disruption **(5)**

Q6. **a)** Deliberate details about the various methods used for precipitation of protein. **(5)**
b) Write a note on theory of centrifugation. **(5)**

Q7. What do you understand by the term HPLC? Discuss the working principle of HPLC with a neat diagram. **(10)**

Q8. **Write short answer on any TWO :** **(5 x 2)**

a) Cryopreservation
b) Electrodialysis
c) Adsorption chromatography
d) Liquid-liquid extraction