

Enrollment No. \_\_\_\_\_


**NAVACHANA  
UNIVERSITY**
*a UGC recognized University*

**School:** School of Science  
**Program:** M. Sc.  
**Year:** 2<sup>nd</sup> **Semester:** 3<sup>rd</sup>  
**Examination:** End Semester Examination  
**Examination year:** December - 2022

**Course Code:** CH244 **Course Name:** Separation Techniques II

**Date:** 08/12/2022

**Time:** 14:30 to 16:30 pm

**Total Marks:** 40

**Total Pages:** 2

**Instructions:**

- Write each answer on a new page.
- Use of a calculator is not required.
- \* COs=Course Outcome mapping. # BTL=Bloom's Taxonomy Level mapping

Q. No.	Details	Marks	COs*	BTL#																											
Q.1	<p>Q. Match the following (write complete options in answer sheet)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Sr. No.</th> <th style="text-align: left;">Column A</th> <th style="text-align: left;">Column B</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Complex formation</td> <td>a) Centrifugation</td> </tr> <tr> <td>2</td> <td>Change in chemical state</td> <td>b) Size exclusion</td> </tr> <tr> <td>3</td> <td>Change in physical state</td> <td>c) Dialysis</td> </tr> <tr> <td>4</td> <td>Partitioning between phases</td> <td>d) Extraction</td> </tr> <tr> <td>5</td> <td>Mass or density</td> <td>e) Filtration</td> </tr> <tr> <td></td> <td></td> <td>f) Distillation</td> </tr> <tr> <td></td> <td></td> <td>g) Masking</td> </tr> <tr> <td></td> <td></td> <td>h) Precipitation</td> </tr> </tbody> </table>	Sr. No.	Column A	Column B	1	Complex formation	a) Centrifugation	2	Change in chemical state	b) Size exclusion	3	Change in physical state	c) Dialysis	4	Partitioning between phases	d) Extraction	5	Mass or density	e) Filtration			f) Distillation			g) Masking			h) Precipitation	5	CO1	BT1, BT2, BT3
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Q.2	<p>Fill in the blanks (Write complete statements in answer book)</p> <ol style="list-style-type: none"> <li>1. A chemical substance existing in one or more than one crystalline form is termed as .....</li> <li>2. A high degree of crosslinking makes the ion exchange resin's structure ..... and also ..... the porosity of the matrix.</li> <li>3. A device for vapor-liquid separator is known as .....</li> <li>4. Full form of DPA is .....</li> <li>5. Simple distillation is also referred as .....</li> <li>6. In membrane filtration, gaseous substances are filtered with .....membranes.</li> </ol>	7	CO1, CO2, CO3, CO4	BT1, BT2, BT3																											

	7. In SFC, with increasing temperature and constant pressure, the density of the sample material .....			
<b>Q.3</b>	Answer the following a) Discuss Triangular phase diagram with an example. b) Discuss the types of membranes processes in brief. c) Explain in brief the physical and chemical properties of solid ion exchangers. d) Discuss the instrumentation of Supercritical fluid Extraction.	<b>8</b>	CO1, CO2, CO3, CO4	BT1, BT2, BT3
<b>Q.5</b>	Explain the following in detail (Any four) (a) Discuss Archimedean screw force with diagram. (b) Explain Craig counter current extraction. Describe in detail the theory of counter current distribution. (c) Describe the theories and mechanism of crystallization and the factors affecting the crystallization process. (d) Explain Ion exchange separation process in detail and factors affecting its selectivity. (e) Discuss Distillation and Sublimation in detail.	<b>20</b>	CO1, CO2, CO3, CO4	BT1, BT2, BT3

\*\*\*\*\*End of Question Paper\*\*\*\*\*