315312

12526

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **10**

a) Define membrane separation with one industrial application.

b) Define asymmetric membrane.

c) Enlist any two membrane modules.

d) List any two membrane preparation methods.

e) Mention any two flow characteristics of MF membrane.

f) State any two advantages of RO membrane separation process.

g) Mention any two types of flow, patterns used in membrane systems.

P.T.O.

Marks

2. Attempt any THREE of the following : **12**

a) Suggest a suitable membrane separation technique to concentrate fruit juice in the food industry. Justify your selection based on membrane characteristics.

b) Illustrate sol-gel peptization method of membrane preparation.

c) Explain cross-flow pattern in membrane separation processes.

d) Compare phase inversion and film stretching methods of membrane preparation.

3. Attempt any THREE of the following : **12**

a) Illustrate classification of membranes based on morphology.

b) Enlist any four characterizations of membranes.

c) Explain transport mechanism in ultrafiltration.

d) Recommend a suitable membrane separation process for removing salt from brackish water and justify your choice with a labled diagram.

4. Attempt any THREE of the following : **12**

a) State advantages and disadvantages of membrane separation processes.

b) Explain principle and parameters affecting working of dialysis stress its two applications.

c) Explain the mechanism of separation in microfiltration (MF) with suitable example.

d) Enlist any your applications of membrane separation processes.

e) Compare MF and UF membrane separation processes.

Marks

5. Attempt any TWO of the following : **12**

a) Explain nano filtration and sate its advantages and disadvantages. (Two each)

b) Explain the working of UF membrane separation process with a labeled diagram.

c) Explain principle and transport mechanism of electrodialysis.

6. Attempt any TWO of the following : **12**

a) Explain bubble point test and liquid displacement characterisation methods.

b) Describe structure and use of spiral wound membrane module.

c) Define Reverse Osmosis and describe RO process working principle with neat diagram.