22513

24225

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

Instructions : (1) All Questions are *compulsory.*

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

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

Marks

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

(a) Enlist different modules for membrane technology.

(b) Write principle for Reverse Osmosis.

(c) State meaning of fouling.

(d) State future of membrane technology.

(e) Define cation & anion.

(f) Enlist factor responsible for fouling.

(g) Write application of membrane technology.

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

(a) Describe with neat sketch plate and frame module.

(b) Describe in detail types of membrane fouling.

(c) Explain scope of membrane in chemical industries for water treatment.

(d) Differentiate cation exchange resin and anion exchange resin.

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

(a) Describe with neat sketch electrodialysis.

(b) Compare hydrophobic synthetic material & hydrophilic synthetic material used as a membrane.

(c) Compare membrane separation with conventional separation process.

(d) Describe principle, construction & working of ultrafiltration as one of the Industrial membrane process.

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

(a) Compare synthetic material and inorganic material for membrane preparation.

(b) Distinguish between microfiltration & reverse osmosis processes.

(c) Describe in detail membrane Bioreactor.

(d) Discuss scope of nanotechnology.

(e) Explain feasibility of membrane.

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

(a) Compare ultrafiltration and microfiltration.

(b) Describe in detail factor responsible for biofouling.

(c) Compare membrane bioreactor with conventional reactor.

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

(a) Differentiate dialysis and electrodialysis.

(b) Describe in detail control of biofouling.

(c) Compare spiral bound module, hollow fiber module and tubular module.