

Total No. of printed pages = 4

**END SEMESTER (REGULAR/RETEST)  
EXAMINATION, JUNE – 2024**

Semester : 6th

Branch : Chemical Engineering

Subject Code : Ch – 603

**PRINCIPLES OF UNIT OPERATION - IV**

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks  
for the questions.

**Instructions :**

- (i) Question Nos.1, 2 and 3 are compulsory.
- (ii) Answer any *five* questions from Question Nos. 4 to 9.

1. Choose the right answers : 1×5=5

(a) In liquid-liquid mixing, the impeller can be  
a

(i) Paddle

(ii) Turbine

(iii) Propeller

(iv) All of these

[Turn over

- (b) The ratio of the surface area of an equal-volume sphere to the actual surface area of the particle is known as
- (i) Sphericity                      (ii) Particle shape
  - (iii) Particle size                (iv) Nominal size
- (c) Which of the following is not a size separation equipment ?
- (i) Grizzly                          (ii) Trommel
  - (iii) Shaking screens            (iv) Paddle mixer
- (d) Which of the following mill works on the principles of combined impact and attrition ?
- (i) Hammer mill                (ii) Ball mill
  - (iii) Roller mill                  (iv) Colloidal mill
- (e) Lumpy, abrasive and hot materials are conveyed by
- (i) Belt conveyor
  - (ii) Screw conveyor
  - (iii) Apron conveyor
  - (iv) Pneumatic conveyor.

2. Write direct answers :

1×5= 5

- (a) What do you mean by comminution ?
- (b) Define "angle of nip".
- (c) What is an Electromagnetic separation ?
- (d) State the purposes of mixing.
- (e) What is conveying ?

3. Match the following Columns :

1×5=5

Column – A	Column – B
(a) Screens	(i) Rubber
(b) Tumbling mill	(ii) Wire
(c) Belt Conveyor	(iii) Ball Mill
(d) Mixing	(iv) Blake
(e) Jaw crushes	(v) Wettability

4. Name the methods of size reduction. Explain the construction and working of any one of the following with a neat diagram.

2+9=11

- (a) Jaw Crusher
- (b) Hammer Mill.

5. What is meant by centrifuging ? Explain the construction and working of the crushing equipment where this can occur. Also draw a neat labelled diagram.

2+9=11

6. (a) State few differences between a Grizzly and a Trommel. 3
- (b) Explain the construction and working of any one the following size separation equipment with a neat diagram : 8
- (i) Froth Floatation Cell
- (ii) Cyclone Separator.
7. Define Mixing. Explain the various equipments used for Liquid-Liquid mixing. 2+9=11
8. State the different conveyors used in industries. Describe the construction and operation of any one with a neat diagram : 2+9=11
- (a) Belt Conveyor
- (b) Screw Conveyor.
9. Write short notes on : 3+4+4=11
- (a) Standard Screen
- (b) Kneading Machine
- (c) Dry mixer.