

312342

23242

3 Hours / 70 Marks

Seat No.

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

**Marks**

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

**5 × 2 = 10**

- (a) Define sphericity of a particle.
- (b) List the names of any four different screening equipments.
- (c) Define the terminal settling velocity of a solid particle.
- (d) State the principle of cyclone separator.
- (e) List the types of impellers.
- (f) State Kick's law. Give its mathematical equation.
- (g) Name any two filtration equipment.

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

**3 × 4 = 12**

- (a) Draw a neat labelled diagram of Blake Jaw crusher.
- (b) Explain the factors affecting screening operation (any four).
- (c) Draw a neat diagram and explain working of fabric filter.
- (d) Explain any two types of agitators with suitable diagrams.



- 3. Attempt any THREE of the following :** **3 × 4 = 12**
- (a) Give any two industrial applications of each of the following :
    - (i) Cyclone separator
    - (ii) Electrostatic separator
  - (b) Draw a neat sketch of Basket Centrifuge and write its construction.
  - (c) Describe the working of wet scrubber with a neat diagram.
  - (d) Name the mixer or blender used for mixing dry powders. Explain construction of it with diagram.
- 4. Attempt any THREE of the following :** **3 × 4 = 12**
- (a) Calculate the operating speed of the ball mill of 1200 mm diameter charged with 75 mm balls. Operating speed is 60% of critical speed.
  - (b) Describe the working of froth flotation cell with a neat sketch.
  - (c) Differentiate between sedimentation and filtration (4 points).
  - (d) Explain the construction of electrostatic separator with neat sketch.
  - (e) Explain vortexing. State the methods used to prevent vortex formation.
- 5. Attempt any TWO of the following :** **2 × 6 = 12**
- (a) Give any two industrial applications each of the following conveyors :
    - (i) Belt conveyor
    - (ii) Screw conveyor
    - (iii) Chain conveyor
  - (b) Explain the construction and working of vibrating screen with a neat diagram.
  - (c) Draw a neat diagram of rotary drum vacuum filter. Explain its construction and working.
- 6. Attempt any TWO of the following :** **2 × 6 = 12**
- (a) Differentiate between crushing and grinding. (Any 6 points)
  - (b) Explain the construction and working of magnetic drum separator with a neat sketch.
  - (c) Explain laboratory batch sedimentation test.
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