22313

11819

3 Hours / 70 Marks   Seat No.

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

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

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

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

(6) 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 sphericity. State its equations with all terms.

   (b) Give the statement of Kicks law with its equation.

   (c) Define capacity & mesh number.

   (d) Define the terminal settling velocity of a solid particle.

   (e) Give the principle working of fabric filter.

   (f) State the importance of transportation in industry.

   (g) List the different types of mixing equipments.

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

    (a) Explain the construction and working of smooth roll crusher.

    (b) Explain the construction and working of magnetic drum separator.

    (c) Draw a neat sketch of Basket Centrifuge and write its construction.

    (d) Explain the working of wet scrubber.

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

    (a) Draw a neat labelled diagram of Blake Jaw Crusher.

    (b) Derive the equation for effectiveness of screen.

    (c) Explain the working of electrostatic precipitator.

    (d) What rotational speed in rpm would you recommend for a ball mill that is 1000 mm in diameter charged with 70 mm balls ?

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

    (a) Derive an expression for the critical speed of ball mill.

    (b) Differentiate between differential and cumulative screening operations.

    (c) Explain 1-2-3-2-1-2-3-2...... filtration system.

    (d) With the help of a neat diagram, explain the construction of rotary vacuum drum filter.

    (e) Explain the working of cyclone separator with neat sketch.

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

    (a) With neat sketch explain the construction and working of fabric filter.

    (b) Explain the construction and working of sigma mixer with neat sketch.

    (c) With neat sketch explain the construction and working of belt conveyor.

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

    (a) Write any two industrial applications of

        (i) Cyclone separator

        (ii) Electrostatic separator

        (iii) Wet scrubber

    (b) Describe the laboratory scale Batch Sedimentation test.

    (c) Describe the principle, construction and working of pneumatic conveyor.

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