11920

3 Hours / 100 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) 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. a) **Attempt any SIX of the following:**   **12**

   (i) Define crushing efficiency.

   (ii) Differentiate between dodge jaw crusher and blake jaw crusher (2 points).

   (iii) Define screen apperture and mesh?

   (iv) Compare ideal and actual screen (2 points).

   (v) List the importance of mixing in industries? (Any two).

   (vi) Define classification, name any two types of classifiers used in process industries.

   (vii) Give the working principle of electrostatic seperator.

   (viii) Draw the diagram of propeller, turbine,paddle.

Marks

b) **Attempt any TWO of the following:** 8

    (i)   Draw labelled diagram of hammer mill and explain its working.

    (ii)   Derive an equation for critical speed of ball mill.

    (iii) Mention the factors affecting the performance of the screen.

2.   **Attempt any FOUR of the following:** 16

    a) Define Bond's law and kicks law for crushing.

    b) With neat sketch explain construction and working of vibrating screen.

    c) Draw various arrangement of trommels.

    d) With neat sketch explain construction and working of spiral classifier.

    e) Explain construction and working of cyclone separator.

    f) Explain the terms :

        (i)   Constant rate filtration

        (ii)   Constant pressure filtration.

3.   **Attempt any FOUR of the following:** 16

    a) Differentiate between crusher and grinders. (4 points).

    b) Define effectiveness of a screen based on oversize and undersize material. Write its formula.

    c) Draw neat sketch of magnetic drum seperator and explain its working.

    d) Draw a sketch showing distribution of pressure drop over cake in filtration operation.

    e) What is the significance of cake resistance? How it is denoted? Give method of reducing cake resistance. (One method).

    f) Draw neat labeled diagram of basket centrifuge.

Marks

4. Attempt any FOUR of the following: 16

a) Differentiate between Grizzlies and Trommel.

b) Explain working of electrostatic seperator with neat sketch.

c) Give the types of filters. List the factors to be considered while selecting the filtration equipment.

d) Explain the role of coagulants in filtration and sedimentation.

e) Define hindered settling and free settling.

f) Differentiate between sedimentation and filteration.

5. Attempt any TWO of the following: 16

a) What should be the diameter of set of rolls which accept feed equivalent to spheres of 50 mm in diameter and crush them to spheres having diameter 15 mm? The coefficient of friction is 0.30.

b) Give the principle of froth floatation? Explain with neat sketch construction and working of floatation cell.

c) Explain the laboratory batch sedimentation test. Give its significance.

6. Attempt any FOUR of the following: 16

a) List the factors to be considered while selecting filter media.

b) List the types of impeller? Draw the flow pattern of oxial and radial flow impeller.

c) Explain vortex formation and swirlling?

d) Explain construction and working of muller mixer.

e) Name the type of mixer will recommend for

(i) Mixing solids with small quantity of liquid coating.

(ii) Mixing of viscus and plastic masses.

(iii) For mixing powder that do not flow easily.

f) Write an expression for power consumption of impeller. Explain the terms.

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