

17313

11819

3 Hours / 100 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) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (7) 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
- (a) What is the importance of size reduction ?
  - (b) Define work index.
  - (c) Draw graphical representation for ideal and actual screen.
  - (d) Give the types of screen analysis.
  - (e) What is homogeneous mixture ? And give the example.
  - (f) List any four eg. of classifier.
  - (g) State the principle of magnetic separation.
  - (h) Name the flow patterns generated in an agitated vessel.

**(B) Attempt any TWO of the following :**

**8**

- (a) Describe the construction of jaw crusher.
- (b) Describe the open circuit and closed circuit grinding.
- (c) Distinguish between crushing and grinding. (4 points)

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

**16**

- (a) Calculate the operating speed of the ball mill from the following data :
  - (i) diameter of ball mill = 500 mm
  - (ii) diameter of ball = 40 mm
  - (iii) operating speed is 50% of the critical speed of the mill.
- (b) Distinguish between the grizzlies and trommel. (4 points)
- (c) Describe the construction and working of vibrating screen.
- (d) Draw a neat sketch of double cone classifier and describe its working.
- (e) Explain the construction and working of cyclone separator.
- (f) Derive the equation for constant pressure filtration for a batch filter.

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

**16**

- (a) Describe the working of ball mill.
- (b) State the factors affecting performance of screen. (4 points)
- (c) Explain the construction and working of electrostatic separator with suitable diagram.

- (d) Define cake filtration and deep bed filtration.
- (e) With the neat sketch describe the working of plate and frame filter press.
- (f) Explain the construction and working of basket centrifuge.

**4. Attempt any FOUR of the following :**

**16**

- (a) Draw a neat sketch of different trommel arrangements.
- (b) Describe the construction and working of Ball – Norton type separator.
- (c) What is the principle of vacuum filter ? Draw a neat sketch of rotary drum filter.
- (d) Draw the neat sketch showing pressure distribution across the cake and filter medium.
- (e) Define : free settling and hindered settling.
- (f) Define terminal settling velocity. Name the type of settling taking place in sedimentation.

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

**16**

- (a) Derive the equation for finding the critical speed of a ball mill.
- (b) What is jigging ? Describe the construction and working of hydraulic jig with neat sketch. State it's industrial application.
- (c) Describe the laboratory batch sedimentation test with diagram.

**P.T.O.**

6. Attempt any **FOUR** of the following :

16

- (a) List the factors affecting rate of filtration ? Describe it.
  - (b) List the importance of mixing (4 points).
  - (c) Describe the methods of prevention of vortex formation.
  - (d) Describe the construction and working of ribbon blender.
  - (e) With neat sketch describe the working of sigma mixer.
  - (f) Explain the construction and working of Muller mixer.
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