22313

11920

3 Hours / 70 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) Figures to the right indicate full marks.

(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 of a particle.

b) State the principles by which size reduction is done in industry.

c) Define the following :

(i) mesh number

(ii) oversize particle

d) Name any one equipment each used for:

(i) Sedimentation

(ii) Filteration

e) Give the working principle of cyclone separator.

f) Name any one conveyor each for the following :

(i) Horizontal movement

(ii) vertical movement

g) Draw the diagram of turbine type agitator.

P.T.O.

Marks

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

a) Explain open circuit and closed circuit grinding.

b) Describe the working of froth flotation cell with a neat sketch.

c) (i) State the factors affecting rate of sedimentation.

(ii) Define free settling and hindered settling.

d) Explain with sketch working of electrostatic precipitator.

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

a) Describe the working of hammer mill with a neat sketch.

b) Calculate the operating speed of the ball mill of 1200 mm. diameter charged with 75 mm balls. Operating speed is 70% of critical speed.

c) Explain the working of magnetic drum separator with a neat sketch.

d) Draw neat diagram with parts and particle entry and exit of the following:

(i) Belt conveyor

(ii) Screw conveyor

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

a) Calculate the power required to crush 150 tons per hour of limestone if 80% of the feed passes 50 mm screen and 80% of the product a 3.125 mm screen.

Work index of lime stone = 12.74

b) Explain the importance of screen analysis in chemical industry.

c) Explain the principle and working of Basket centrifuge.

d) Sketch rotary drum vacuum filter. Explain its working.

e) Give the industrial applications of fabric filter and electrostatic filter (two each)

Marks

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

a) With neat sketch explain construction and working of wet scrubber.

b) Explain swirling and vortexing. Explain the methods to prevent swirling and vortex formation.

c) Give any two industrial applications each of the following conveyors.

(i) Pneumatic conveyor

(ii) Chain conveyor

(iii) Screw conveyor

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

a) Describe with sketches the batch sedimentation test.

b) With neat sketch explain positive type pneumatic conveyor.

c) Identify the mixer / blender used for mixing dry powder. With neat sketch explain its construction.