

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 2289924

Roll No.

B.TECH.

Regular Theory Examination (Odd Sem-III), 2016-17

MECHANICAL OPERATION

Time : 3 Hours

Max. Marks : 100

SECTION - A

1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (10×2=20)
- What is the fluidization?
 - Define Rittingers and Kicks Law of Crushing.
 - Define unit operation and unit process.
 - What is screen effectiveness?
 - Define filtration and factors affecting rate of filtration.
 - Write the name of the different methods of solid-liquid separation.
 - What are the applications of screens in chemical industry?
 - Define critical speed?

- Classify the various screening equipments.
- Define angle of nip.

SECTION - B

Note : Attempt any five questions from this section. (5×10=50)

- Differentiate Open circuit and closed circuit grinding operation. Discuss the differential analysis and cumulative Analysis.
- A material is crushed in a jaw crusher and the average size of the particle reduced from 5cm to 1cm, with the consumption of energy 1.32×10^4 J/kg. What will be the consumption of energy to crush the same material of an average size of 7.5 cm to 2.5 cm, assuming
 - Rittingers law and
 - Kicks law.
- Derive the expression for finding the efficiency of the screen in a screening operation?
- With the help of neat sketch explain the construction and working of Blake jaw crusher?
- Explain the batch and continuous weighing techniques. How the weighing of bulk solids made?
- With the help of a neat sketch construction and operation of a vibrating screen and also explain Tyler Standard screen series?

NCH - 302

8. Discuss the principle and operation of Froth-flotation with the help of the neat sketch? Derive the equation and draw the plot t/V versus V in constant pressure filtration.
9. Explain the working of a conical Ball Mill with the help of a neat sketch.

SECTION - C

Note : Attempt any two questions from this section.
(2×15=30)

10. Describe the minimum fluidization velocity and applications in industry. Derive the CormanKozeny and Erguns equation for flow through packed beds.
11. A leaf filter filtering slurry gave a total of 8m^3 filtrate in 30 minutes. Filtration was continued till 11.3 m^3 of filtrate was collected. Estimate the washing time minutes, if 11.3 m^3 of wash water are used. The resistance of cloth can neglected and a constant pressure is used thought.
12. What are the different kinds of conveyors used in chemical industries? Discuss the working of Bucket conveyor in detail.