No. of Printed Pages : **2**

21MNP2C6L

Sl. No.

M.Tech. II Semester Degree Examination, Sept./Oct. - 2024

MINERAL PROCESSING

Comminution and Sizing

(NEP)

Time : 3 Hours Maximum Marks : 70

Note : *(i) Question number **1** is **compulsory**.*

*(ii) Answer **any five** of the following.*

1. (a) Write the mechanism of fracture and list the objectives of comminution. **7**

(b) With a line diagram, explain the principle of operation of gyratory crusher. **7**

2. (a) Explain the bonds energy law in detail and discuss the work index. **7**

(b) A material of 1.5'' diameter spherical particles is intended to be crushed in a roll crusher. Assuming co-efficient of friction between the rock and the steel to be 0.29 and reduction ratio to be 3:1, calculate the minimum diameter of rolls required. Also calculate the capacity of the roll crusher. *(Assume the rolls rotates at 60 rpm and Sp. Gr.of the material is 2.7)* **7**

3. (a) The average particle size of 20 mm of Quartz is crushed to a product of average particle size of 5 mm at a rate of 12 tons/hr. At this rate, the mill takes 20 kw power. It requires 0.7 kw to run mill empty. What will be the power consumption if the same feed was crushed to a particle diameter to 10 mm ? Assume that rittinger's law is valid. **7**

(b) Explain the working principle of Hammer Mills and its advantages. **7**

P.T.O.

4. Graphically represent the below shown sieve analysis test data on a linear graph and find out d50, d80. **14**

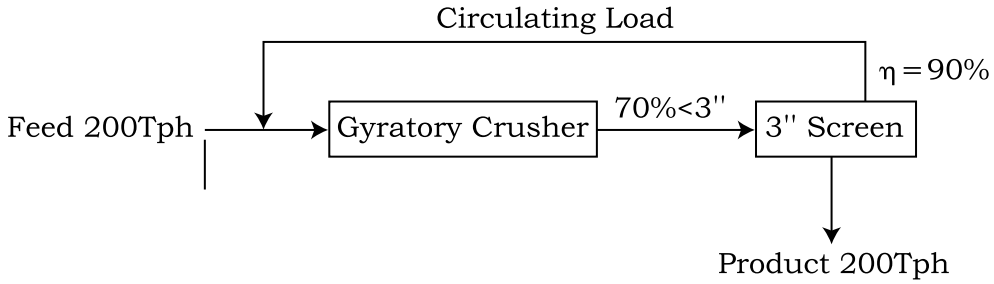
Mesh number	Retained mesh size in microns	Weight of material in g
+12	1410	16.5
−12+14	1190	33.2
−14+20	840	29.5
−20+28	595	32.2
−28+35	420	24.5
−35+48	297	20.4
−48+65	210	19.3
−65+100	149	24.0
−100+150	105	15.2
−150+200	74	19.7
−200		55.2

5. (a) Explain the types of liners in tumbling mills. **7**

(b) Write a note on open and closed circuit grinding. **7**

6. Describe the working principle of cone crusher with a line diagram. **14**

7. Discuss the below flowsheet and calculate the circulating load if the screen efficiency is 85%. **14**



8. (a) Define work index, explain the procedure for calculating Bonds work index. **10**

(b) Define the terms : Concentrate, Tailings and Middling's. **4**

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