



Sl. No.

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

**MINERAL PROCESSING**

**Ore Classification and Gravity Separation Processes**

**(NEP)**

Time : 3 Hours

Maximum Marks : 70

- Answer **any five** of the following questions. Each question carries **equal** marks. **5**
1. (a) Derive the expression for the free settling ratios under stokes and Newtonian conditions. **5**
- (b) Derive an expression for terminal velocity of a 50 micron Quartz Sphere falling under the stokes conditions. **5**
- (c) What is mineral beneficiation ? What type of ores need mineral beneficiation ? **4**
2. (a) Enumerate the fundamental difference between a sizing and sorting classifiers. **5**
- (b) Feed containing 30% solids, is fed to a cyclone, % solids in overflow and underflow are 20% and 55% respectively. Calculate the tonnage of solids per hour. **5**
- (c) What is Reynolds number ? Discuss the physical significance of Reynolds number. **4**
3. (a) Write in brief with necessary illustration "Bird's cycle" and "Meyer's cycle". **5**
- (b) Write note on Deck shape and Riffle pattern of a shaking table. **5**
- (c) Write notes on flowing film concentration. **4**
4. (a) What is the enhanced Gravity Separation ? With a neat sketch, describe Falcon and Knelson concentrators. **10**
- (b) Write a short note on Kelsey Jig. **4**



**P.T.O.**

5. (a) What is the basic principle of Heavy Media Separation ? **6**  
(b) Explain the classification of DMS Separators. **4**  
(c) Write in brief the Dyna Whirl Pool Separator. **4**
6. (a) What is the operation principle of cone classifiers ? **5**  
(b) A beneficiation plant treats 200 tons/day of lead ore. Assay analysis of samples of feed, concentrate and tailing determined as 4.4% Pb, 55% Pb, and 0.05% Pb. Calculate the amount of concentrate recovered, percentage of recovery and loss of lead in tailing. **5**  
(c) Write in brief about the floatex density separator. **4**
7. (a) Describe the stratification mechanism of Jigging Process. **5**  
(b) List out any four beneficiation operations and indicate their industrial applications. **5**  
(c) How does a rake classifier work ? **4**
8. (a) What is Stub Cyclone ? Explain the operational principle with neat diagram. **5**  
(b) With neat sketch explain Batac Jig with its applications. **5**  
(c) What are the differences between hydro-cyclones and sub cyclones ? **4**

