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Total Number of Pages: 02

**B.TECH**  
**PEMT5302**

**5<sup>th</sup> Semester Regular / Back Examination 2015-16**  
**MINERAL PROCESSING**

**BRANCH: MM, MME**

**Time: 3 Hours**

**Max Marks: 70**

**Q.CODE: T709**

**Answer Question No.1 which is compulsory and any five from the rest.**  
**The figures in the right hand margin indicate marks.**

**Q1** Answer the following questions: **(2 x 10)**

- a) What is the volume % solid in a pulp containing 65 wt% solids? Average specific gravity of solids is 2.70.
- b) Define Pelletizing.
- c) Explain the principles of comminution.
- d) Draw the flow sheet for a basic crushing plant.
- e) With the help of suitable diagram explain the difference between open and closed circuit grinding.
- f) Define Concentration criterion.
- g) What are Collectors? Give some examples of collectors.
- h) Define Filtration. What are the factors affecting rate of filtration.
- i) 1 ton of chalcopryrite containing 2% copper is floated to obtain a concentrate containing 25% copper. If the mass of the concentrate is 60kg, find the percent of copper in tailing.
- j) For the recovery data obtained in a laboratory flotation test, the lead recovery is

	Mass	Assay
Head	2000g	2.1%Pb
Tailing	-	0.1%Pb
Concentrate	70g	55.1%Pb

- Q2** a) With a suitable flow sheet explain the beneficiation process of gold ore. **(5)**  
b) Explain the beneficiation process of beach sand with the help of a suitable flow sheet. **(5)**
- Q3** a) Explain the construction and operational features of a gyratory crusher with the help of a suitable diagram **(5)**  
b) Explain the construction and operational features of a roll crusher with the help of a suitable diagram. Derive the relation between friction coefficient and angle of nip. **(5)**
- Q4** a) Discuss the formation of bubble mineral complex in flotation. What are the essential properties of a good collecting agent? **(5)**  
b) With a neat sketch discuss the working principle of a disc pelletizer. **(5)**

- Q5** a) What is thickening process? Draw a simplified diagram showing common features of a conventional thickener. (5)  
b) Explain motion of charge in tumbling mill and derive the equation for critical speed. (5)
- Q6** a) Explain the term recovery, ratio of concentration, enrichment ratio. How they are calculated. Derive relevant formula. (5)  
b) Explain the operation of a jigging machine with the help of a suitable diagram. (5)
- Q7** a) Explain the principle and working of high tension separator with the help of a suitable diagram. (5)  
b) What are the main purposes of screens in mineral industry? Derive the expression for efficiency of screens. (5)
- Q8** Write short notes on any two: (5 x 2)  
a) Free Settling and Hindered Settling  
b) Rittinger's, Kick's and Bonds law of size reduction  
c) Effect of particle size in magnetic separation  
d) Dense media separation