Registration No. :

Total number of printed pages – 2

B. Tech

PEMT 5302

Fifth Semester (Back/Special) Examination – 2013

MINERAL PROCESSING

BRANCH CODE : MM, MME

QUESTION CODE : D 370

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10
   (a) What is cyclone ? Name different types of cyclones used in mineral industries.
   (b) What do you mean by locked particles ?
   (c) What do you mean by degree of liberation of a comminuted material ?
   (d) The number 200 in a 200 mesh sieve indicates how many openings.
   (e) What are the different standard of sieves available ?
   (f) How wearing on balls in a ball mill is compensated ?
   (g) What is Hindered Settling ?
   (h) What do you mean by sintering ?
   (i) Name two aluminium and two copper ore.
   (j) What is an activator ?
2. (a) Explain different techniques of sampling in the Mineral Industries. Discuss their advantages and limitations. 5
   (b) A flotation tailing reduced to pass 100-mesh screen contains about 0.3% Copper as Chalcopyrite. What weight of sample is required to assure correctness of sampling to 0.01% Copper, assuming the Chalcopyrite to be all free and Sp.gr. of the tailing to be 2. 5

   Or

   What is an electrostatic separator ? What type of ore can be concentrated by this method ?

P.T.O.

3. (a) Name the different types of gyratory crushers. Write down the characteristics of a Gyratory Crusher. 5

(b) Explain the principle of operation of a Suspended-Spindle gyratory Crusher with the help of neat sketch. 5

4. (a) Discuss the mineral preparation for magnetic separation and mention the properties of minerals that influence magnetic separation 5

(b) What are the different types of magnetic separator ? Explain working and performance of drum separator. 5

5. (a) Discuss the Significance of Flotation Reagents with special reference to, Frother, Collector, Regulator and Activator. 5

(b) With atypical flowsheet discuss the beneficiation of iron ore. 5

6. (a) How energy consumption (input) varies with the speed of ball mill and percentage load ? 5

(b) What will be the actual speed in r.p.m. of a ball mill with 1200 mm. internal diameter charged with 75 mm ball ? 5

Or

Discuss reducibility and LDT test of iron ore pellets.

7. (a) State and explain laws of classification. 5

(b) What will be the size of the galena particle which is setting at the same rate as that of a quartz particle having a diameter of 1.75 mm in a fluid of specific gravity 2.1.(sp.gr. of galena is 9.5 and Sp.gr. of quartz is 2.65) ? 5

Or

What do you mean by agglomeration ? Name different type of agglomeration and their importance in metallurgical industry.

8. Write short notes on any **two** of the following : 5×2

(a) Electrostatic Separator

(b) Angle of Nip

(c) Free Settling and Hindered Settling

(d) Briquetting

(e) Comminution.