Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

P EMT 5302

Fifth Semester Examination – 2013

MINERAL PROCESSING

BRANCH : MME, MM

QUESTION CODE : C-395

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 are activators ?
   (b) Explain the principle of froth flotation.
   (c) Give laws of crushing and work index.
   (d) Distinguish between diamagnetic and paramagnetic materials.
   (e) What do you understand by tailing ?
   (f) How ball wearing in a ball mill is compensated ?
   (g) What is the difference between fluxed sinter and self-fluxed sinter ?
   (h) What do you mean by hindered settling of particles ?
   (i) What is Rittinger's law ?
   (j) What do you mean by jigging ?
2. (a) Explain the laws of settling. Describe the Application of thickeners in water reclamation. 2.5+3.5
   (b) Discuss the application of Filters in Mineral Dressing. 4
3. Write short notes on any **two** of the following : 5×2
   (a) Blake Separator
   (b) Reducibility test for iron ore pellets
   (c) Types of classifiers

P.T.O.

(d) Gyratory crusher

(e) Principle of sintering

(f) Tabling.

4. (a) Discuss the properties of minerals that influence the magnetic separation. What preparation is required on minerals for magnetic separation ? 5

(b) Classify magnetic separators. Discuss the performance of Drum separators. Discuss the Merits of Wet separators over Dry separators in the treatment of fine materials. 5

5. (a) What is meant by froth floatation? Explain the functions of the following terms in flotation : 5

(i) Frothers

(ii) Collectors

(iii) Depressors

(iv) Activators.

(b) In a ball mill of 3000 mm diameter steel balls of diameter 200 mm are used for crushing. If the mill is operated at 20 rpm, at what speed the mill have to run if the balls of 200 mm diameter are to be replaced by 85 mm balls? Keeping unchanged all other conditions during operation. 5

6. (a) What do you mean by agglomeration ? Discuss the advantages of using pellets in iron making. 5

(b) Discuss the theory of bonding in pellets. Explain the mechanism of ball formation. 5

7. (a) Draw a typical flow sheet for iron ore beneficiation. 5

(b) What is heavy media separation? How this is applied in industrial coal washing ? 5

8. (a) What is grinding ? How does it differ from crushing ? Explain the various types of grinding operations. 5

(b) Discuss about 'linear wear' and 'ball wear' in ball mills. Which is more severe and why ? 5