

Total number of printed pages – 4

B. Tech
CPMN 6306

Sixth Semester Examination – 2008

MINERAL ENGINEERING AND FUEL TECHNOLOGY

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. (a) Mention *true* or *false* and give correct answer to the false one : 1×8
- (i) Frother reduces the surface tension of the liquid on its surface.
 - (ii) In flowing film concentration differential velocity of a flowing liquid film is maximum at or near the top of the film and nil at the bottom.

- (iii) The operating speed of a ball mill should be more than the critical speed.
 - (iv) In comminution the energy expended is in the form of kinetic energy and energy recovered is in the form of potential energy.
 - (v) Grizzle is moving type screen.
 - (vi) Coke preparation is essentially a carbonization process.
 - (vii) In flowing film concentration Velocity of the fluid at a given distance from the deck is a function of the film thickness.
 - (viii) Flotation and agglomeration are the process of concentration.
- (b) Answer the following in brief : 2×6
- (i) What are the forces act at the bottom of a flowing film ?
 - (ii) What do you mean by efficiency of a comminuting operation ?
 - (iii) What do you mean by proximate analysis of coal ?
 - (iv) What are the variety of screening surface ?

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- (v) Why different minerals display various resistance to crushing ?
- (vi) What is a paramagnetic substance ?
2. (a) Explain the purpose of industrial screen sizing. 2
- (b) Describe screening Efficiency and Capacities 3
- (c) Explain the important factors that effect the rate at which an undersize material pass through a screening surface. 5
3. (a) Describe the Physico-Chemical principles involve in Floatation ? Discuss the significance of floatation reagent. 3+3
- (b) Discuss the formation of bubble mineral complex in Floatation. 4
4. (a) What is the basic principle of Electrostatic Separation ? Discuss with reference to Separation by Repulsion and Separation by Attraction. 6
- (b) Discuss application of Electrostatic Separation. 4
5. (a) What do you mean by carbonization of Coal ? Discuss different type of carbonization process. 2+4

- (b) Discuss washability curves for washability characteristics of coal. 4
6. (a) What is Jigging ? Discuss conditions for Jigging. 2+3
- (b) How Jigs are classified ? Discuss Jigging Cycles. 2+3
7. Write short notes on any *three* of the followings: 10
- (a) Application of Dielectric Constant in Mineral Separation
- (b) Merits of wet magnetic separator over Dry Magnetic separator
- (c) Caking index of coal
- (d) Plunger Jig
- (e) Importance Riffles to tabling.
8. (a) Discuss the Principles of Classification of fuel. 5
- (b) Describe the performance of Hydraulic and Surface Classifiers. 5