

Total Pages—5

(Set-R₂)

B.Tech - 4th
Mineral Engineering and Fuel Testing

Full Marks : 70

Time : 3 hours

Answer Q. No. 1, which is compulsory and
any five from the rest of the questions

The figures in the right-hand margin indicate marks

1. Answer the following (any ten) : 2×10
- (a) What is Floatex density separator ?
 - (b) What is angle of repose ?
 - (c) What is angle of nip ?
 - (d) What is methanation reaction in producer gas ?
 - (e) What is a concentration criterion ?
 - (f) What do you mean by crushing efficiency of a crusher ?

(Turn Over)

(2)

- (g) For efficient grinding what should be the speed of ball mill ?
- (h) What is attrition ?
- (i) What do you mean by blinded screen ?
- (j) What do you mean by ultimate analysis of coal ?
- (k) What is an acid sinter ?
- (l) What is caking index of coal ?
- (m) What is hindered settling ?
- (n) What is the composition of Blast Furnace Gas ?

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

- (i) Bomb calorimeter 5 × 2
- (ii) Heavy media separation
- (iii) Importance of pelletization
- (iv) Principle of electrostatic separation.
- (v) Characteristics and uses of Blast Furnace Gas.

3. (a) Discuss the main purpose of Fine grinding during mineral Dressing. What are the principle drawbacks of Grinding Mills ? 3 + 3

(b) Discuss the theory of Ball Mill operation with a neat sketch showing different zones in a Ball Mill. 4

4. What do you mean by agglomeration ? Discuss the importance of different agglomeration techniques with special reference to sintering and pelletizing in ferrous industries. 10

Or

Describe with a suitable flowsheet, the beneficiation of any *one* of the following minerals : 10

(a) Lead-Zinc sulphide ores

(b) Non-sulphide ores of copper

(c) Gold ore.

5. (a) Explain with the help of a neat sketch the principle of operation of a standard Cone Crusher ? 6
- (b) Discuss the merit of Cone Crusher over gyratory Crusher. 4
6. (a) What is coal carbonization ? Discuss with a neat diagram production of Metallurgical Coke by Waste heat Oven. 6
- (b) Discuss how the Hardness and Strength of Coke is measured. 4
7. (a) Discuss the physic-chemical principles involved in froth floatation ? Discuss various reagents used in froth floatation process. 6
- (b) Name the advantages of Heavy Media Separation process. 4
8. (a) What are the different techniques by which sampling is done in mineral industries ? Indicates their advantages and limitations ? $6\frac{1}{2}$

(5)

(b) How is sampling done in wet pulps ? $3\frac{1}{2}$

Or

(a) Name the different types of Gyratory Crushers.
Explain with the help of a neat sketch
explain the principle of operation of a
suspended-spindle Gyratory Crusher. 2 + 5

(b) What are the characteristics of Gyratory
Crushers ? 3
