

VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA
DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING
SESSION 2014-15 (EVEN SEMESTER)

Total Pages—5

(Set-1)

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 the difference between Crusher and Grinder ?
- (b) What is super fluxed sinter ?
- (c) What do you mean by proximate analysis of coal ?
- (d) What do you mean by middling ?
- (e) What is Rittinger's crushing law ?
- (f) For efficient grinding what should be the speed of ball mill ?

(Turn Over)

- (g) What is the role of frother in flotation ?
- (h) What do you mean by calorific value of a solid fuel ?
- (i) What is angle of nip ?
- (j) What do you mean by theoretical air requirement for combustion of fuel ?
- (k) Name some common types of screening equipments.
- (l) What are the various zones of a mechanical classifier ?
- (m) What is Floatex density separator ?
- (n) What is the basis of hand sorting ?
- (o) What is gangue material ?
2. Write short notes on two of the following : 5×2
- (i) Water gas
- (ii) Free settling and Hindered settling
- (iii) Pelletizing

(3)

(iv) Reduction ratio

(v) Shaking tables

(vi) Limitation of Industrial Screening.

3. (a) Give an account of the principle of operation of a Blake Jaw Crusher with the help of a neat sketch. What materials are generally used for lining the Jaw plates and Check Plates ? 5 + 2
- (b) What are the characteristics of Jaw Crushers ? 3

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

4. (a) Derive an equation for the critical speed of a ball mill. What is the effect of speed of the mill on the grinding action ?
- (b) What do you mean by the term 'capacity' of the ball mill ? How it is expressed and on what factors does it depend ?
5. (a) What is the arithmetic relation between the retained and passing cumulative percentage in a sieve analysis ?
- (b) Briefly discuss capacity of the screen and Efficiency of the screen.

Or

- (a) What do you mean by agglomeration ? Discuss the importance of agglomeration techniques in metallurgical industries.
- (b) Explain principle of sintering. Discuss important process variables for the production of good sinter.

- Prisyan*
- (a) Discuss the desirable Laws of Classification. Mention the conditions for classification. 6
- (b) Describe the operation of a Dorr Classifier with the help of a Sketch. 4
7. (a) Discuss the production of producer gas. Mention the principal chemical reactions taking place in plant using coke/coal as fuel. 5
- (b) Discuss the different factors that affect the composition of producer gas. Mention different uses of producer gas. 5
8. (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