

Registration No :

--	--	--	--	--	--	--	--	--	--

Total Number of Pages : 03

B.Tech
PMI4I101

4th Semester Regular / Back Examination 2017-18

COMMUNICATION & CLASSIFICATION

BRANCH : MINERAL

Time : 3 Hours

Max Marks : 100

Q.CODE : C685

Answer Part-A which is compulsory and any four from Part-B.

The figures in the right hand margin indicate marks.

Answer all parts of a question at a place.

Part – A (Answer all the questions)

Q1 Answer the following questions : *multiple type or dash fill up type* : (2 x 10)

- a) Which of the following have the higher work index?
(i) Coal
(ii) Iron ore
(iii) Graphite
(iv) All have same work index
- b) The unit of bond work index is _____
- c) Which one of the following is used as primary crusher
(i) Jaw crusher
(ii) Gyratory crusher
(iii) Both "i" and "ii"
(iv) Non or the above
- d) Grinding in jaw crusher happens due to _____
- e) 20 mesh screen means
(i) 20 openings per linear inch
(ii) 20 openings per linear cm
(iii) 20 openings per square inch
(iv) 20 openings per square cm
- f) One micron is equal to
(i) 10^{-4} m
(ii) 10^{-4} cm
(iii) 10^{-4} mm
(iv) 10^{-4} ft
- g) When feed rate increases product size _____ in ball mill
- h) Product quality in a hydrocyclone can be controlled by
(i) feed rate
(ii) inlet pressure
(iii) apex diameter
(iv) all the above

- i) Screen efficiency of an industrial screen is always _____
(i) 100 %
(ii) < 100 %
(iii) = 0 %
(iv) = 100 %
- j) Unit operations involving wet classification depends on terminal settling velocity of particles _____
(i) true
(ii) false

Q2 Answer the following questions : Short answer type : (2 x 10)

- a) What do you understand by reduction ratio?
b) What is the critical speed of ball mill?
c) Why mill liners are used?
d) Give names of two scrubbing equipments.
e) What is a pebble mill?
f) Name two different types of industrial screens.
g) How product is discharged from ball mill?
h) What are the different types of underflow discharges in hydrocyclone?
i) Name four operating or design parameters of a vibrating screen.
j) Name four criteria for selection of a crusher.

Part – B (Answer any four questions)

- Q3 a) What do you understand by bond work index? Explain in detail the procedure to measure it. (10)**
b) Name five size reduction equipments? (5)
- Q4 a) What do you understand by open and close circuit grinding? Explain with neat schematic diagram for the both. What are the equipments used in each of the circuit? (10)**
b) What is the difference between ball mill and rod mill ? (5)
- Q5 a) What are the different classifiers used in the mineral industries? Explain in detail with the working principle, advantages and limitations of hydro cyclone. (10)**
b) Write short note on partition curve. (5)
- Q6 a) Explain in detail the working principle of ball mill with a neat schematic diagram. (10)**
b) Write short note on fluid energy mill. (5)
- Q7 a) What are the different types of jaw crushers? What are the working principles, advantages and limitations of jaw crusher? Explain with schematic diagram. (10)**
b) Write short note on roll crusher. (5)

- Q8 a)** One tonne per hour of Iron ore is produced by crushing and then screening through 1mm screen. Using the screen analysis given below calculate the screen efficiency? **(10)**

Screen size, micron	Feed, wt.%	Undersize, wt.%	Oversize, wt%
10000	1.2	0	15
5000	25.2	0	18
3000	15.6	0	25
2000	12.4	0	20
1000	11	5.1	11
850	4.8	20	11
710	4.5	11	0
500	2.1	5.2	0
300	1	16.3	0
150	0.8	13.2	0
100	6.2	10	0
-100	15.2	19.2	0
	100	100	100

- b)** Write short note on screen efficiency. **(5)**
- Q9 a)** It is desired to reduce the size of iron ore from a feed size of 200 mm to 100 μm in a plant for beneficiation. Design a suitable comminution and classification circuit for achieving the above objective. Provide justification for each of the unit operations used in the circuit. Proper assumption may be taken. **(10)**
- b)** What are the steps to be followed for optimization of a crushing circuit? **(5)**