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Total Number of Pages: 02

**B.Tech**  
**PCML4304**

**6<sup>th</sup> Semester Regular / Back Examination 2016-17**

**MATERIAL HANDLING SYSTEMS**

**BRANCH: MINERAL**

**Time: 3 Hours**

**Max Marks: 70**

**Q.CODE: Z125**

**Answer Question No.1 which is compulsory and any five from the rest.  
The figures in the right hand margin indicate marks.**

**Q1 Answer the following questions: (2 x 10)**

- What precautions should workers take when moving materials manually?
- How you design of Material handling Systems?
- Write the property of bulk load.
- What is the mass capacity of flat belt conveyor if volumetric capacity 0.55 m<sup>3</sup>/hr? ( $\rho = 1500 \text{ kg/m}^3$ )
- What is Fork lift truck?
- Given that sprocket A has 19 teeth and rotates at 1500 rpm, what is the rpm of sprocket B which has 38 teeth?
- Match the following

Device	Purpose
A. Overhead crane	1. horizontal transportation
B. Pumps	2. lifting and lowering
C. chutes	3. lifting and transportation

- Differentiate between unit load and bulk load.
- Write different types of gates used in bulk material handling system.
- An inclined belt conveyor is used for loading goods. If speed of the belt having 1500 mm width is 3 m/s then what is the volumetric capacity of the conveyor?

(For  $21^\circ$ ,  $k = 2.35 \times 10^{-4}$ )

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- Write the factors in which the power transmitted by a belt depends. (2)
  - Describe Patterns of discharge from hoppers with neat diagram. (8)
- Describe stacking and blending technique with a diagram. (5)
  - Explain the objectives and principles of material handling. (5)

- Q4** a) Explain the basic hoisting system and their special applications. (5)  
b) Write the major causes of silo failures due to shortcomings. (5)
- Q5** a) Explain briefly the hopper design procedure. (5)  
b) How the bulk material handling system monitored online? (5)
- Q6** a) Mass capacity of a conveyor is 200 ton/hr, if speed of the belt is 4 m/s then what is the width of horizontal flat belt conveyor carrying the load? (Surcharge factor = 0.075 &  $\rho = 1000 \text{ kg/m}^3$ ) (5)  
b) An iron ore of slurry condition need to be transported 50 km through undulation area. Select the suitable method of transport and Explain it? (5)
- Q7** Describe the construction and working of a belt conveyor. Write the safety devices used in belt conveyor. (10)
- Q8** Write short answer on any TWO: (5 x 2)  
a) Mechanical loader  
b) Rapid loading system  
c) Merry-go-round systems  
d) scrappers