

Total number of printed pages – 6

B. Tech
PEMN 6415

Eighth Semester Examination – 2008

**MATERIAL HANDLING AND
TRANSPORT IN MINES**

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. Answer the following questions : 2×10
- (i) Which bulk transportation system is commonly preferred in India and why ?
- (ii) In a sand gathering plant, a belt of 1200 mm width runs at a speed of 250 m/min.



Calculate the amount of sand carried per hour if the cross sectional area of the load be 0.1490 m^2 and the weight of 1 m^3 of sand is 1500 kgs.

- (iii) What are holdbacks ? Why are they used ?
- (iv) Name the different types of special conveyors used in mines ?
- (v) What is blending ? Why is it carried out in mines ?
- (vi) Why bicable aerial ropeway is mostly used than monocable ropeway ?
- (vii) What are silos ?
- (viii) What material properties affect the flow of materials from a bunker ?
- (ix) Why reclamation of material carried out ?

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PEMN 6415

2

Contd.

- (x) What is merry-go-round system ?
2. (a) Discuss the different properties of bulk material that are taken into account while selecting a transportation system ? 6
- (b) Write the classification of bulk material transportation systems ? 4
3. 3 million tones of coal per annum is required to be transported to a thermal power plant situated at a distance of 7 km from a mine. The mine is served by two inclines for material transport. Which transportation method do you recommend and why ? Give a suitable layout for the same. 10
4. (a) Describe in brief the factors to be considered while planning for transport system using with scraper chain conveyor. 5

- (b) With the help of a neat diagram discuss the loop take-up arrangement used in belt conveyor installation. 5
5. (a) What are the causes of the belt running off at the tail drum and also mention the remedial measures to be taken for the same. 7
- (b) Why fluid coupling is used in belt conveyor drive ? 3
6. (a) A cable belt conveyor is required to convey material of bulk density 1.2 t/m^3 at a rate of 600 tonnes per hour up an incline of 1200 m length and a total lift of 150 m. Calculate the motor power required. The cross sectional area of material on

the belt can be taken as $w^2/11$, where w is the width of the belt in m. The width of the belt is 1 m. The total mass of moving parts per metre length of the conveyor is 100 kg. The co-efficient of friction between the rope and the pulleys for empty and loaded sides are 0.2 and 0.3 respectively.

6

(b) Give a comparison between hydraulic and pneumatic conveying.

4

7. (a) Explain with the help of a schematic diagram the working of a stacker.

5

(b) Draw the schematic layout of any one of the rapid loading systems and discuss its merits.

5

8. (a) Enumerate the factors that affect the selection of appropriate storage systems in mines.

4

(b) What are the differences between bin, bunker and chute ? Describe with sketches.

6