



Elective course (2) Materials Handling

مقرر اختياري (2) نقل المواد (المواد)

This Exam measures the following ILOs: a3, a12, a13, b2, b6, c16, and c18

Assume any missing data.

Question 1

(15 Marks)

- 1) What is the definition of material handling? Why is it important?
- 2) Define the terms “containers” and “unitizers”.
- 3) What is the definition of unit load? What is the advantages of using it?
- 4) Compare between the large and small unit loads.
- 5) Discusses the important features of the containers?

Question 2

(15 Marks)

- 1) If the processing time of a product = 2-time units per piece and material handling time = 6-time units per move, what will be the minimum unit load size and corresponding number of transfers? Sketch the processing and moving time of 6 products.
- 2) What are the material transport equipment? Give 3 different examples of each one.
- 3) What are the automatic identification and communication equipment?
- 4) What are the common methods of unitizing a unit load?
- 5) What are the important factors used in conveyors, trucks, and cranes selection?

Question 3

(15 Marks)

- 1) What are the chutes conveyor problems?
- 2) A load of 250 Kp is conveyed from 3rd floor to the storage at the ground by spiral chute. The coefficient of friction = 0.45, height of one floor is 2.8 meters, $v_i = 0.3$ m/sec and $v_f = 2$ m/sec.

Find:

- (a) Angle of inclination
- (b) Total length
- (c) Conveying time
- (d) Work done by gravity force
- (e) If $v_i = v_f$, calculate the inclination angle

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(مقرر اختياري ٢ نقل و تداول المواد)

Question 4

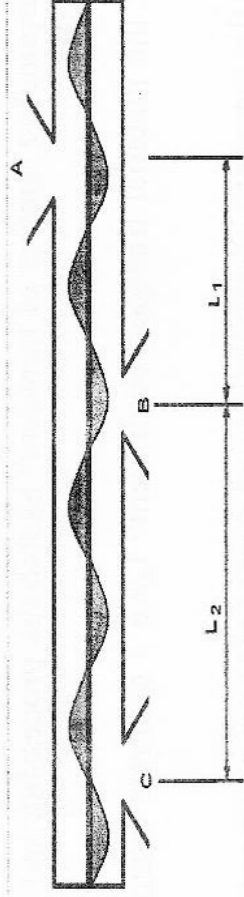
(15 Marks)

- 1) Describe with the help of sketch the screw conveyor.
- 2) Cement is conveyed by horizontal screw conveyor with one feed hopper A and two discharges B and C. The first discharge is at length L_1 while the second is at L_1+L_2 from the feed hopper. The conveyor can be discharged at B and C simultaneously or separately at B or C.

Given: $D = 500$ mm, $n = 50$ r.p.m, $L_1 = 8$ m, $L_2 = 10$ m, and $Q_b/Q_c = 2/3$

Determine:

- (a) Maximum capacity, and
- (b) The required minimum and maximum motor power.



Question 5

(15 Marks)

- 1) Discuss in brief the belt conveyor components.
- 2) A conveyor of belt type trough 300 transform coal of capacity 2500 Mp/hr. The belt length is 600 m made of Reyon 200, number of plies 6 and rubber cover 3:2 and its width is equal to 1200 mm. Working in medium operating condition on roller bearings. If the lifting height is 30 m and the wrap angle is 210o and $\mu = 0.4$.

Required:

- (a) The belt velocity
- (b) The driving forces
- (c) The power at driving pulley
- (d) The belt forces (tension)
- (e) Minimum diameter of the driving pulley
- (f) Length of idlers for upper and lower strand
- (g) No. of idlers

The End