MAJOR TEST
Bulk Materials Handling ITL 752

Time Allowed: Two Hours **Max. Marks: 35**
Date: 23.11.2015

Answer All Questions

1.

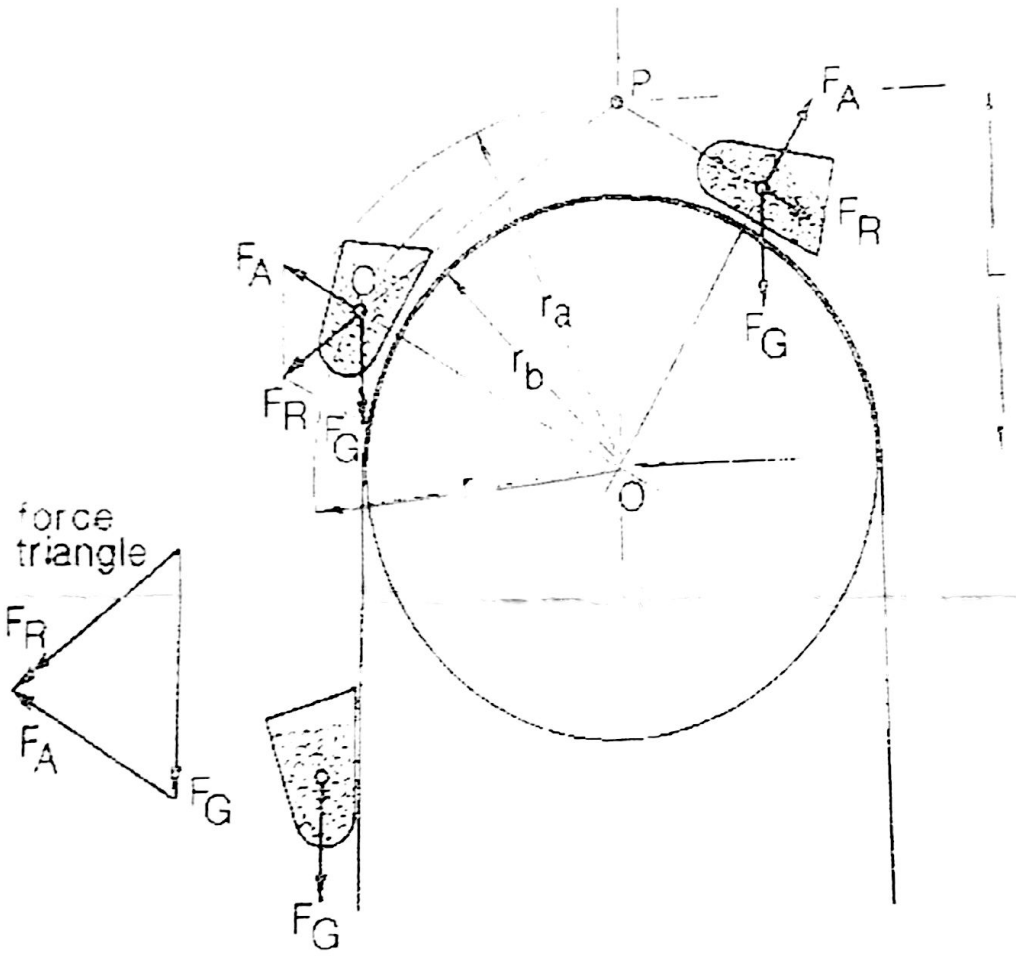

Figure 1.

(a) Discuss the main features of two principal types of bucket elevator and explain the classification in relation to the position of the pole point, P, in Fig 1. (4)

(b) Show that the position of the pole point can be approximated by

$$L = g / (2 \pi N)^2$$

where N = rotational speed of the head wheel. (4)

2. (a) What are the main and secondary resistances in calculating power required for a belt conveyor system? Using appropriate equations, derive an expression for the motor power required. (4)

(b) What main factors influence the choice of carcass and cover of a belt conveyor? (4)

3. (a) Summarise the advantages and disadvantages of screw conveyors compared to other types of conveyor. What are the types of flights used in screw conveyors and what is the application of each of the flights. (4)

(b) With the help of a suitable sketch, derive an expression for the maximum speed of rotation of a screw conveyor. (4)

4. (a) For a given air supply pressure, product flow rate will decrease with increase in distance. Explain, why, for a product capable of being conveyed in dense phase, its dense phase conveying capability will decrease with increase in distance for the given pressure drop, and an increase in air flow rate will be necessary to convey the product. (3)

(b) Explain the relationship between the bulk density and voidage in relation to bulk materials. (4)

(c) With the help of the sketch shown below, explain how a twin blow tank arrangement **in series** can be used for continuous conveying of material. (4)