Question 1
A closed loop conveyor is 180 mt long between a loading station and an unloading station. Part carriers are spaced along its length equally every 3 mt, and it carries one part. The time required to load and unload at the respective station is 0.18 min. The flow rate is 4.0 parts/min. **Evaluate** the conveyor system design according to speed rule, capacity constraint, and uniformity principle.

Question 2
A closed loop conveyor is 250 m. long between a loading station and an unloading station. Part carriers are spaced along its length equally every 3 m. and it carries one part. The time required to load and unload at the respective station is 0.20 min. The flow rate is 5.0 parts/min. **Evaluate** the conveyor system design according to speed rule, capacity constraint, and uniformity principle.

Question 3
A cosed loop conveyor is 150 mt long between a loading station and an unloading station. Part carriers are spaced along its length equally every 3 mt, and it carries one part. The time required to load and unload at the respective station is 0.15 min. The flow rate is 3.0 parts/min. **Evaluate** the conveyor system design according to speed rate, capacity constraint, and uniformity principle.

Question 4
A closed loop conveyor is 180 mt long between a loading station and an unloading station and a speed of 18-m/min. Part carriers are spaced along its length equally every 3.5 mt, and it carries one part. The time required to load and unload at the respective station is 0.2 min. The flow rate is 5.0 parts/min. **Evaluate** the conveyor system design according to speed rule, capacity constraint, and uniformity principle.

Question 5
A closed loop conveyor is 180 mt long between a loading station and an unloading station and a speed of 18-m/min. Part carriers are spaced along its length equally every 3.5 mt, and it carries one part. The time required to load and unload at the respective station is 0.2 min. The flow rate is 5.0 parts/min. **Evaluate** the conveyor system design according to speed rule, capacity constraint, and uniformity principle.

Question 6
A closed loop conveyor is 240 mt long between a loading station and an unloading station. Part carriers are spaced along its length equally every 3 mt, and it carries one part. The time required to load and unload at the respective station is 0.15 min. The flow rate is 5 parts/min**. Evaluate** the conveyor system design according to speed rule, capacity constraint, and uniformity principle.

Question 7
A closed loop conveyor has a length of 200-m long between a loading station and an unloading station and a speed of 15-m/min. Part carriers are spaced along its length equally every 4-m and it carries one part. The time required to load or unload at the respective station is 0.15 min. The flow rate is 3-parts/min. Is the conveyor system is feasible? If the system is not feasible, how to make it feasible?

Question 8
A closed loop conveyor has a length of 250-m long between a loading station and an unloading station and a speed of 20-m/min. Part carriers are spaced along its length equally every 5-m and it carries one part. The time required to load or unload at the respective station is 0.15 min. The flow rate is 3-parts/min. Is the conveyor system is feasible? If the system is not feasible, how to make it feasible

Question 9

A closed loop conveyor is 150 mt long between a loading station and an unloading station. Part carriers are spaced along its length equally and each carries two parts. The time required to load and unload at the respective station is 0.15 min. The flow rate is 4 parts/min. Find the speed of conveyor and carrier spacing that satisfy speed rule, capacity constraint, and uniformity principle.

Question 10

A closed loop overhead conveyor is to be designed to deliver parts from one load station to one unload station. Forward and return loops will be 90m long each. The specified flow rate of parts 300 parts/hr and conveyor speed = 0.5 m/s. The loading time $T_L = 9+3\ n_p$, second, where n_p = number of parts/carriers. For (n_p =1, 2, 3, or 4), determine which of the four values are feasible and specify for each the appropriate design parameters for (a) spacing between carriers and (b) number of carriers that will achieve the flow rate.

Question 11

A recirculating conveyor is used to transport parts between loading and unloading stations The conveyor is 250 m long anda speed of 20 m/min. The flow rate of the parts delivered between the two station is 200 parts/hr. Each carrier is capable of holding up to three parts (n_p =1,2, or 3) and the time needed to load the carrier is $T_L = 8+4n_p$ sec. Specify the appropriate design parameters for (1) Spacing between carriers, and (2) Number of carrier that achieve the flow rate.

Question 12

A roller conveyor moves a large tote pan in one direction 60-m between load station and unload station at speed of 40-m/min.

A) If each tote pan holds 8 parts. With one worker, the time to load parts into a tote pan at load station is 5 sec per part. In addition, it take 12 sec to put a tote pan on conveyor. Determine:
   a) Spacing between tote pan centers flowing in the conveyor system.
   b) Flow rate of parts on the conveyor system.

B) If smaller tote pan holds one part is used, and the time to load parts into a tote pan at load station is 5 sec per part. In addition, it take 7 sec to put a tote pan on conveyor. What are the change in spacing and flow rate?

Question 13

A roller conveyor moves a large tote pan in one direction 60-m between load station and unload station at speed of 40-m/min. Each tote pan holds 8 parts. With one worker, the time to load parts into a tote pan at load station is 5 sec per part. In addition, it takes 12 sec to put a tote pan on conveyor. Determine:

a) Spacing between tote pan centers flowing in the conveyor system.
b) Flow rate of parts on the conveyor system.

Question 14

A closed loop conveyor is 120 m. long between a loading station and an unloading station. The time required to load and unload at the respective station is a function of the number of parts in carrier and equal [$0.25+0.07n_p$] min. The flow rate is 6.0 parts/min.

a. Find the number of parts in carrier to make the system feasible.
b. Evaluate the conveyor system design according to speed rule, capacity constraint, and uniformity principle.

Question 15

A closed loop conveyor is 90 m. long between a loading station and an unloading station. The time required to load and unload at the respective station is a function of the number of parts in carrier and equal [0.15+0.05n_p] min. The flow rate is 5.0 parts/min. Find:

a. The number of parts in carrier to make the system feasible.
b. The appropriate number of carriers
c. The spacing between carriers.

Question 16

A closed loop conveyor is designed to deliver parts from a load station and unload station. Forward and return loops will be 90 m each. The specified flow rate of Parts to be delivered between the two stations is 360 parts / hr. The conveyor has carriers equally spaced by a distance and each carrier hold one part. If the conveyor speed is 36 m/min. The load time is 0.167 min

a) Calculate the following conveyor design parameters:
   i. Spacing between carriers ($\mathbf{s_c}$)
   ii. The loading time ($\mathbf{T_L}$), is the time feasible
   iii. The number of carriers ($\mathbf{n_c}$)
b) If the carrier can hold 3 parts and loading time is $\mathbf{T_L = 0.15+0.05n_p}$ in minutes where; $\mathbf{n_p}$= number of parts in carrier. Recalculate the conveyor design parameters. Is the system is feasible?

Question 17

A closed loop conveyor is 90 m. long between a loading station and an unloading station. The time required to load and unload at the respective station is a function of the number of parts in carrier and equal [0.15+0.05n_p] min. The flow rate is 5.0 parts/min**. Find:**

a. The number of parts in carrier to make the system feasible.
b. The appropriate number of carriers.
c. The spacing between carriers.

Question 18

A conveyor is used to transport parts between two stations. There are 29 carriers equally spaced around the conveyor, with 3 m separation between carriers. The material flow patterns for the workstations follow: [f_1 (n)] = (-2, -4, -2); [f_2 (n)] = (3,2,3)]. Determine the required carrier capacity.

Question 19

A conveyor is used to transport parts between three stations. There are 31 carriers equally spaced around the conveyor, with 3 m separation between carrier. The material flow patterns for the workstations follow: [f_1 (n)] = (0, -4, 0); [f_2 (n)] = (3,2,3); [f_3 (n)] = (0, -4, 0). Determine the required carrier capacity.

Question 20

A conveyor is used to transport parts between three stations. There are 25 carriers equally spaced around the conveyor, with 1 m separation between carrier. The material flow patterns for the workstations follow: [f_1 (n)] = (-1, -4, 0); [f_2 (n)] = (3,4,3); [f_3 (n)] = (0, -4, -1). Determine the required carrier capacity.

Question 21

A conveyor is used to transport parts between three stations. There are 18 carriers equally spaced around the conveyor, with 1 m separation between carrier. The material flow patterns for the workstations follow: [f_1 (n)] = (-1, -4, -1,-1); [f_2 (n)] = (3,4,4,3); [f_3 (n)] = (0, -4, -1,-2). Determine the required carrier capacity.

Question 22

A conveyor is used to transport parts between three stations. There are 23 carriers equally spaced around the conveyor, with 1 m separation between carrier. The material flow patterns for the workstations follow: $[f_1(n)] = (-1, -4, -1, -1, -2)$; $[f_2(n)] = (3,4,4,3,2)$; $[f_3(n)] = (0, -4, -1, -2, 0)$. Determine the required carrier capacity.

Question 23

A conveyor has 25 equally spaced carriers. Three load/unload stations are placed on the conveyor. Find the necessary carrier capacity, if the cyclic loading function are: -

$$f_1 = \{2,3,1\},\ f_2 = \{-1,,-2,0\},\ f_3 = \{0,-2,-1\}$$

Question 24

A conveyor has 31 equally spaced carriers. Three load/unload stations are placed on the conveyor. Find the necessary carrier capacity. The stations have cyclic loading function of

$$f_1 = \{0,1,2,1,2\},\ f_2 = \{0,-1,-1,0,0\},\ f_3 = \{-1,-1,0,-1,-1\}$$

Question 25

A conveyor has 26 equally spaced carriers. Three load/unload stations are placed on the conveyor. Find the necessary carrier capacity. The stations have cyclic loading function of

$$f_1 = (0,-1,-1,0,0),\ f_2\{0,1,2,1,2\},\ f_3 = \{-1,-1,0,-1,-1\}$$

Question 26

A conveyor has 27 equally spaced carriers. Three load/unload stations are placed on the conveyor. Find the necessary carrier capacity, if the cyclic loading function are: -

$$f_1 = \{2,1,2,3,1\},\ f_2 = \{-1,,-2,0,-2,0\},\ f_3 = \{0,-2,-1,-1,0\}$$

Question 27

A conveyor has 23 equally spaced carriers. Three load/unload stations are placed on the conveyor. Find the necessary carrier capacity. The stations have the cyclic loading function are: -

$$f_1 = \{2,1,2,3,1,3,2\},\ f_2 = \{-1,,-2,0,-2,0,-3,0\},\ f_3 = \{0,-2,-1,-1,0,0,-2)\}$$

Question 28

A conveyor has 31 equally spaced carriers. Three load/unload stations are placed on the conveyor. Find the necessary carrier capacity, if the cyclic loading function are:-

$$f_1 = \{2,3,1,2,3,1,2\},\ f_2 = \{-1,,-2,0,-2,0,-3,0\},\ f_3 = \{0,-2,-1,0,-1,-1,-1\}$$

Question 29

A conveyor has 24 equally spaced carriers. Three load/unload stations are placed on the conveyor. Find the necessary carrier capacity, if the cyclic loading function are:

$$f_1 = \{2,3,1,3,2,1,4\},\ f_2 = \{-1,-2,0,-3,-1,0,-1\},\ f_3 = \{0,-2,-1,-2,0,-1,-2\}$$