

M.Tech. Mechanical Engineering Design (CBCS) Semester - II
MED24(C) - Design of Mechanical Handling System

P. Pages : 2

Time : Three Hours

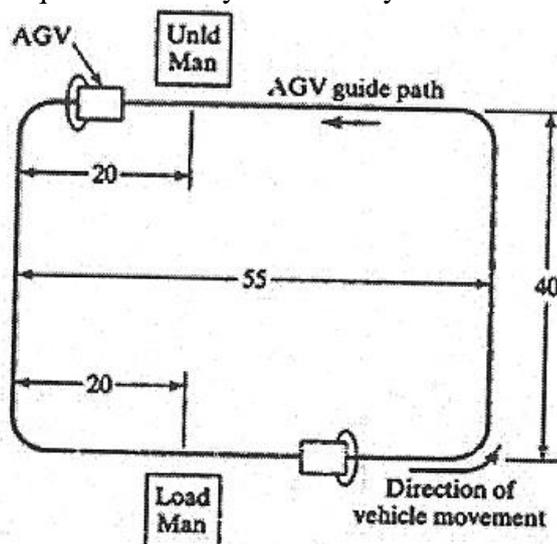


GUG/S/23/14198

Max. Marks : 70

- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Diagrams and Chemical equation should be given wherever necessary.
 5. Illustrate your answers wherever necessary with the help of neat sketches.
 6. Use of slide rule, Logarithmic tables, Steam tables, Mollier's chart, Drawing instruments, Thermodynamic tables for moist air, Psychrometric charts and Refrigeration charts is permitted. Use of non programmable calculator is permitted.
 7. Solve **any five** questions.

1. a) Explain in detail the different pipeline feeding devices used for low pressure pneumatic conveying systems. **7**
b) Explain various design consideration for Conveyers belts. **7**
2. a) Explain design considerations for screw conveyers with suitable practical application. **7**
b) Explain in detail dense phase pneumatic conveying system with neat sketch. **7**
3. Given the AGVS layout shown in figure vehicles travel counterclockwise around the loop to deliver loads from the load station to the unload station. Loading time at the load station = 0.75 min, and unloading time at the unload station = 0.50min. It is desired to determine how many vehicles are required to satisfy demand for this layout if a total of 40 del/hr must be completed by the AGVS. The following performance parameters are given: vehicle velocity = 50m/min, availability = 0.95, traffic factor = 0.90, and operator efficiency does not apply, so $E = 1.0$. Determine : (a) travel distances loaded and empty, (b) ideal delivery cycle time, and (c) number of vehicles required to satisfy the delivery demand. **14**



4. a) List the principles of material handling. Explain any three in details. 7
b) Explain carrier chain and flat-top chain conveyor's. 7
5. a) Explain the various load chains and types of ropes used. 7
b) Explain cabin conveyors in brief and give industrial application on it. 7
6. a) What are standard of Ramshorn Hooks? Where are they used? Explain with the help of neat sketches. 7
b) What is a unit load? Describe various Unit Load system in detail? 7
7. Explain with suitable application pressure drop calculation in pneumatic conveying system. 14
8. Write short notes on:
- i) Packing and storage of materials. 5
ii) Physical facilities MMS. 5
iii) Travelling mechanism of cantilever and monorails cranes. 4
