



Allowed Tables and Charts: None

Answer all the following Questions

(60 Marks)

Question (1)

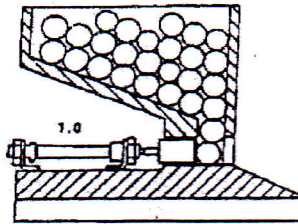
[25 Marks]

- Explain with the clear sketch and steps the operation idea of Refrigerated Dryer Cycle in pneumatic systems? **(6 Marks)**
- State (including sketches and ranges of pressure) three types of compressors used in pneumatic systems. What are the main characteristics of single and double acting compressors? **(7 Marks)**
- What are the main functions of Air Filter, Pressure Regulator and Lubricator in Pneumatic system? Explain your answer with neat sketches **(6 Marks)**
- Compare between the direct control and indirect control of single acting cylinder of pneumatic system. **(6 Marks)**

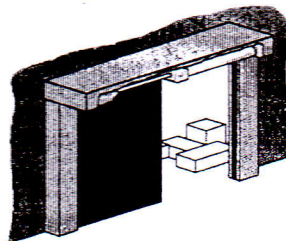
Question (2)

[35 Marks]

- Discuss and draw neat sketches indicating the impulse operation of a control valves in pneumatic system with double acting cylinders. **(7 Marks)**
- Pins are to be fed from a hopper to the next station one at a time using a Pneumatic Cylinder. Speed of the double acting cylinder should be adjustable both during forward and return motion. The process of feeding should be initiated using a detent push button. Develop a suitable Pneumatic control circuit. **(7 Marks)**



- For safety reasons, the entrance door to a storeroom in a supermarket must open and close slowly. An indirect controlled double-acting cylinder is used to slide the door. Build and test the pneumatic circuit to open and close the door slowly **(7 Marks)**



- Establish a simple Time-Dependent Control pneumatic circuit. Indicate your answer with sketch the steps of operation. **(7 Marks)**
- How do you can control the return of cylinder piston of a double acting cylinder at a pre-determined pressure? Please indicate your answer with suitable sketch. **(7 Marks)**

***** End of Questions *****

Best Wishes

Professor Wageeh El-Askary & Professor Kamal A. Ibrahim