

	<p>the unit load principle. Suppose the tote pans were smaller and could hold only one part rather than eight. Determine the flow rate in this case if it takes 7 sec to load a tote pan onto the conveyor (instead of 9 sec for the larger tote pan .and it takes the same 3 sec to load the part into the tote pan.</p>	
Q4	<p>An automated storage/retrieval system installed in a warehouse has five aisles. The storage racks in each aisle are 30 ft high and 150ft long. The S/R machine for each aisle travels at a horizontal speed of 350 ft/min and a vertical speed of 60 ft/min. The pick-and-deposit time = 0.35 min. Assume that the number of single command cycles per hour is equal to the number of dual command cycles per hour and that the system operates at 75% utilization. Determine the throughput rate (loads moved per hour) of the AS/RS.</p>	CO4
Section C		
1. Each Question carries 20 Marks.		
Q1	<p>(a) Describe the different types of Automated guided vehicles systems. (b) Describe the parameters of storage system performance</p> <p style="text-align: center;">OR</p> <p>A 10-aisle automated storage/retrieval system is located in an integrated factory-warehouse facility. The storage racks in each aisle are 15 m high and 95 m long. The S/R machine for each aisle travels at a horizontal speed of 1.5 m/sec and a vertical speed of 0.5 m/sec. Pick-and-deposit time = 20 sec. Assume that the number of single command cycles per hour is one-half the number of dual command cycles per hour and that the system operates at 80% utilization. Determine the throughput rate (loads moved per hour] of the AS/RS</p>	CO3
Q2	<p>Describe the function and design of carousel storage system. A single carousel storage system has an oval rail loop that is 30ft long and 3ft wide .Sixty Cameras are equally spaced around the oval. Suspended from each carrier and five bins. Each bin has a volumetric capacity = 0.75ft³ .Carousel speed = 100ft/min. Average pick-and—deposit time for a retrieval = 20 sec. Determine: (a) volumetric capacity of the storage system and (b) hourly retrieval rate of the storage system.</p>	CO4