GANPAT UNIVERSITY
M.Tech.[ME(AMT)] Sem-I
REGULAR EXAMINATION DECEMBER 2013
3ME105 MANUFACTURING AUTOMATION

TIME – 3 HOURS **TOTAL MARKS- 70**

INSTRUCTION:- 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions wherever necessary.

SECTION-I

Que-1 [12]

(a) What is Carousel Storage Systems?
(b) What are the application areas of ASRS?
(c) What are the different types of industrial trucks use in material transport equipment?

OR

Que-1 [12]

(a) Explain different types of AS/RS system.

(b) What is the difference between a hoist and a crane?
(c) What are the components and operating features of AS/RS system?

Que-2 [11]

(a) What features distinguish self- guided vehicle from conventional AGVS?
(b) A recirculating conveyor has a total length of 300 m. Its speed is 60 m/min, and the spacing of part carriers along its length is 12 m. Each carrier can hold two parts. The task time required to load two parts into each carrier is 0.20 min and the unload time is the same. The required loading and unloading rates are both defined by the specified flow rate, which is 4 parts/min. Evaluate the conveyor system design with respect to Kwo's three principles.

OR

Que-2 [11]

(a) What is a conveyor? Explain recirculating conveyor?
(b) Consider the AGVS layout shown in Fig.1 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 = 0.50 min. 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 = 50 m/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.

Que-3 Attempt Any three. [12]

(a) What is Hard automation and Soft automation? Explain them.
(b) What is the USA principle? What does each of the letters stand for?
(c) Enlist ten strategies for automation and process improvement. Identify five of these

strategies.

(d) What is the necessity for manufacturing automation?

SECTION-II

Que-4 [12]

(a) Name the different types of clamps used with jigs and fixtures. Explain any three.

(b) Explain Cylindrical locators, Vee locators and Flat locator methods of work piece.

OR

Que-4 [12]

(a) Explain Conical locator, Jack Pin locator and Drill Bush locator methods of work piece.

(b) Explain different types of drilling Jigs.

Que-5 [11]

(a) What is PLC? What are the demerits of conventional hardwire automation panel boards? How PLC can overcome those problems?

(b) What is the importance of various blocks of microprocessor? How microprocessor works?

OR

Que-5 [11]

(a) Draw block diagram of PLC. Explain function of various blocks.

(b) Explain Adaptive control in manufacturing

Que-6 **Attempt Any three.** [12]

(a) Why Hydraulic is more efficient than Pneumatic, Explain with suitable example.

(b) Draw the hydraulic circuit diagram for operation of drilling machine.

(c) Enlist component of hydraulic system and explain each.

(d) Briefly explain solenoid valve. Draw the symbols for solenoid valves used in hydraulics.
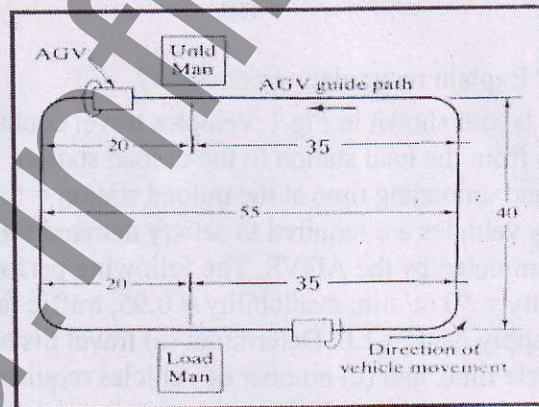

Fig.1

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