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**Second Semester M.Tech. Degree Examination, June/July 2015**

**Flexible Manufacturing Systems**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions.**

- 1
  - a. Define FMS and list its application. (04 Marks)
  - b. List the different types of flexibilities. Explain FMS user flexibility. (10 Marks)
  - c. Name and explain briefly basic components of FMS. (06 Marks)
  
- 2
  - a. Mention the various FMS layouts, and explain inline layout and loop layout. (07 Marks)
  - b. Explain the four major phases that an FMS user goes through to implement his FMS. (08 Marks)
  - c. List the major steps for the development of FMS project. (05 Marks)
  
- 3
  - a. What is an automated guided vehicle? List its application. (04 Marks)
  - b. Explain briefly, different types of material handling equipment. (06 Marks)
  - c. It is desired to determine how many vehicles will be required to satisfy demand for a particular AGVS. The system must be capable of making 40 deliveries/hr. The following characteristics of the system are:
 

Vehicle velocity	= 150 ft/min
Average distance travelled/delivery	= 450 ft
Pick-up time	= 45 sec
Drop-off time	= 45 sec
Average distance travelling empty	= 300 ft
Traffic factor	= 0.90.

 Determine the number of vehicles required to satisfy the delivery demand. Also determine the handling system efficiency. (10 Marks)
  
- 4
  - a. Define and explain different types of AS/RS. (06 Marks)
  - b. Consider the operation of a unit load AS/RS that uses an S/R machine for each aisle of the system. The length of the storage is 300 ft and its height is 50 ft. Horizontal and vertical travel speeds of the S/R machine are 400 ft/min and 75 ft/min, respectively. The S/R machine required 30 sec to accomplish a P and D operation. Determine the single-command and dual-command cycle times for the storage system. (10 Marks)
  - c. Explain briefly carousel storage systems. (04 Marks)
  
- 5
  - a. Write a note on Petrinet modeling technique. (10 Marks)
  - b. What is a queuing network model? Explain closed queuing network model. (10 Marks)
  
- 6
  - a. Define group technology. Explain the four general methods for grouping parts into families. (10 Marks)
  - b. List the benefits of group technology. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 7 a. Explain the concept of a single machine scheduling and flow shop scheduling, by its characteristics. (10 Marks)
- b. Find the optimum sequence for the following 3 machines and 5 jobs and also find the idle time.

	Machines		
	M/C 1	M/C 2	M/C 3
1	8	5	4
2	10	6	9
3	6	2	8
4	7	3	6
5	11	4	5

(10 Marks)

- 8 a. What is JIT? List its objectives.
- b. Bring out the benefits of JIT.

(10 Marks)

(10 Marks)

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