Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – SUMMER • 2015

Subject Code: 172506 **Date:06/05/2015**

Subject Name: Flexible Manufacturing Systems

Time:02.30pm-05.00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** What is flexible manufacturing system? Give the justification of need for FMS in modern manufacturing industries. **07**

(b) Dedicated FMS is called as a flexible transfer line- Evaluate the statement. Compare dedicated FMS with random order FMS. **07**

Q.2 **(a)** With suitable figure explain various types of FMS layout configuration and their applications. **07**

(b) Define manufacturing cell. Give classification of manufacturing cell. **07**

OR

(b) ABC manufacturing company management wants to change its single machine cell having CNC machining center in to unattended machining cell. Give necessary suggestions to the company management for fulfill this requirement. Also give beneficial reasons of unattended machining. **07**

Q.3 **(a)** What is the importance of part coding in group technology? Hybrid coding system is most suitable for coding of the parts in manufacturing industry then monocode system and polycode system – Evaluate the statement. **07**

(b) Briefly explain functions of following terms. **07**

(a) Surface Sensing Probe (b) Broken Tool Detection (c) Multiple Spindle heads

OR

Q.3 **(a)** XYZ manufacturing company wants to form GT cells for manufacturing their various parts. It has collect the data give in following table regarding visit of the parts to the various machines during their manufacturing. Form the part-machine incident matrix and identify logical part family and machine groups using rank order clustering technique. **07**

Machine Name	Machine Code	Visit of various parts to the machine
Cutoff	01	A, D, H
Lathe	02	E, I
Turret Lathe	03	C, E, I
Milling Machine	04	B, F
Manual Drill	05	A, H
NC drill	06	C, I
Grinding Machine	07	B, F, G

(b) CNC horizontal machining centers are not suitable for machining on flat plate type workpiece – Evaluate the statement. Compare horizontal and vertical machining center. **07**

Q.4 **(a)** What is deburring? Why deburring of the machined parts required? Briefly explain vibratory deburring process. **07**

	(b)	Ruby is used as a CMM probe tip – Evaluate the statement. Compare fixed bridge and moving bridge CMM structure and their applications.	**07**

OR

Q.4	**(a)**	Give the various functions of automated material handling system.	**07**
	(b)	What is importance of automated measurement workstation in flexible manufacturing cell? Which are the different functions to be performed by CMM in FMS.	**07**
Q.5	**(a)**	The length of AS/RS is 400 m and its height is 100 m. Horizontal and vertical speed of S/R machine is 250 m/min and 75 m/min respectively. The P & D time is 0.6 min. Determine the average single command and dual command transaction times for the storage system.	**07**
	(b)	What is tool management? Discuss various tool management strategies used in FMS.	**07**

OR

Q.5	**(a)**	In order to determine the number of vehicles required to meet the demand for a particular automated guided vehicle system. The system must be capable of making 60 deliveries per hour. The following are the data of performance characteristics of the system: Vehicle Velocity = 50 m/min, Average distance travel per delivery = 150 m, Pick up time = 0.45 min, Drop up time = 0.45 min, Average distance traveling empty = 100m, Traffic Factor = 0.8. Determine the number of vehicles required to meet the demand of delivery. Also determine the handling system efficiency.	**07**
	(b)	Discuss various stages of FMS implementation in manufacturing industry.	**07**

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