GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII EXAMINATION – SUMMER 2016

Subject Code:172506Date:05/05/2016Subject Name:Flexible Manufacturing Systems (Department Elective - I)Time:02:30 PM to 05:00 PMTotal Marks: 70Total Marks: 70

Instructions:

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- Q.1 (a) (i) Enlist the limiting conditions under which the flexible manufacturing 03 systems turn out more rigid and also suggest the ways to avoid such situations citing one industrial case.

(ii) Compare and Contrast: Flexible Manufacturing System with Flexible 04 Manufacturing Cell.

- (b) (i) "Roundness testers cannot be replaced by coordinate measuring machine as regards to measurement of roundness" Evaluate.
 (ii) Compare typical process layout with cellular layout by citing an industrial case and show that cellular manufacturing supports concepts of lean manufacturing.
- Q.2 (a) (i) "Axis of CNC machining centre either vertical or horizontal, has a great relevance with reference to cutting force distribution on machine tool structure, indexing capabilities, machine vibration along with productivity" Evaluate.
 (ii) Compare and contrast: Vibratory deburring with Cryogenic deburring.

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(b) Enlist the type of automated guided vehicles and state their positive features, 07 limitations and applications.

OR

- (b) Enlist the general assumptions made while computing transaction cycle for automatic storage and retrieval system and suitably justify the basis of these assumptions.
- Q.3 (a) "Reverse engineering of the component in coordinate measuring machine is difficult as CMM has only three rectilinear axes for movement and a fixed domain of volume measurement" Evaluate.
 - (b) Enlist the benefits of group technology affecting many industrial areas and bring 07 out the challenges during application of group technology.

OR

- Q.3 (a) Enlist the factors that govern the selection of type of Coordinate Measuring 07 Machine and its probe.
 - (b) Enlist the process steps to be followed in grouping the products/parts for cellular manufacturing on the basis of similarity in geometry; manufacturing features etc. Also justify every process step suggested for constructing a manufacturing cell.
- Q.4 (a) State the problems caused by tool capacity constraints and lack of tool 07 management. Also bring out the principal elements of tool room service.
 - (b) Compare and Contrast: Batch type and In-line washing stations.

OR

Q.4 (a) Enlist the most common identification system for tool presetting and bring out 07 the specific features, limitations and application of these systems.

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- (b) "Extrude honing; a method of smoothing and polishing internal surfaces and 07 producing controlled radii is used for deburring of machined parts." Evaluate the statement in the context of deburring complex, inaccessible zones demanding deburring.
- State the significance of part coding in group technology and suggest the types 07 Q.5 (a) of coding system used in the manufacturing industry.
 - **(b)** The following are the data of the AGV system. Vehicle velocity: 45 m/min, Pick up time: 45 s Average distance travelled/delivery: 135 m Drop off time:45 s, Traffic factor: 0.9 Average distance traveling empty: 90 m Determine the number of vehicles required to satisfy the delivery demand of 40 delivers per hour.

OR

- In order to determine the number of vehicles required to meet the demand of 07 Q.5 (a) particular automated guided vehicle system, the system must be capable of making 40 deliveries per hour. The following are the data of performance characteristics of the system. Vehicle velocity: 150 m/min. Pick up time: 0.75 min Average distance travelled/delivery: 450 m Drop off time: 0.75 min, Traffic factor: 0.9 Average distance traveling empty: 300 m Determine the number of vehicles required meet the demand of delivery. 07
 - Enlist aims, objectives and principles of Flexible Manufacturing System. **(b)**

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