Code No: R32246 **R10** **Set No: 1**

III B.Tech. II Semester Supplementary Examinations, January -2014
PRODUCT DESIGN AND ASSEMBLY AUTOMATION
(Automobile Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1. a) Sketch and explain spiral elevators.
   b) Sketch and explain the balanced vibratory feeder.

2. What are the different mechanical feeders? Explain working and constructional features of any two mechanical feeders.

3. a) Define flexible automation.
   b) Explain features of flexible automation.

4. List out the parameters considered for effect of quality levels of parts in indexing machines and explain any one of it.

5. Classify the different types of automated assembly system with schematic diagram.

6. Discuss briefly the effect of part thickness and part size on handling time.

7. a) What are the reasons for jamming in the assembly systems and mention the methods for avoiding?
   b) What is risk assemble and mention its effects in long - run?

8. a) Derive the expression for total cost for each acceptable assembly.
   b) Derive the average production time of acceptable assemblies.

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Code No: R32246 **R10** **Set No: 2**

III B.Tech. II Semester Supplementary Examinations, January -2014
PRODUCT DESIGN AND ASSEMBLY AUTOMATION
(Automobile Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1. a) Draw the schematic diagram of a orienting system analysis and explain each term.
   b) Sketch and explain orientation of narrow track system.

2. Derive the expression for maximum feed rate for external gate feeder.

3. Write about advantages and disadvantages of fixed automation.

4. Derive an expression of proportion down time for free transfer machines and list out the values of buffer storage capacity be on the basis of factor k.

5. a) What are objective meet by the product design for assembly handbook.
   b) What are the phases involved in design process of a product?

6. With suitable example, discuss the two kinds of symmetry for a part.

7. a) Sketch and explain the design concepts to provide easier access during assembly.
   b) Discuss the three conditions drawn between penalty time and basic time.

8. Briefly discuss the effect of parts quality on downtime.

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Code No: R32246 **R10** **Set No: 3**

III B.Tech. II Semester Supplementary Examinations, January -2014
PRODUCT DESIGN AND ASSEMBLY AUTOMATION
(Automobile Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1. a) Describe about future automated factory and its elements.
   b) Sketch and explain various position orientation systems used in practice.

2. a) Write about rotary center board hopper feeder.
   b) Discuss about tumbling-barrel hopper feeder.

3. What are the fundamental strategies employed to smoothen the automation and explain them?

4. a) Differentiate between continuous transfer and intermittent transfer.
   b) With an example, explain intermittent transfer mechanism.

5. List out the simple rules to be considered in designing of produce and parts in automatic assembly.

6. a) What are the advantages and disadvantages of manual assembly and mention the criteria for implementation?
   b) How the handling time is affected by the size and weight of the component?

7. a) Deduce the empirical expression to estimate the manual insertion time.
   b) Sketch and explain the kinematic design principles in manual assembly.

8. a) How the performance of assembly systems is evaluated and used in practice?
   b) How the economy of robot usage is calculated in automation?

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Code No: R32246 **R10** **Set No: 4**

III B.Tech. II Semester Supplementary Examinations, January -2014
PRODUCT DESIGN AND ASSEMBLY AUTOMATION
(Automobile Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1. a) What are the basic principles of automation and how it improves quantity of production?
   b) What are the various feeding systems used in practice and explain about construction and Working of a feeder?

2. a) Sketch and explain the frequency of parts selection of a centerboard hopper feeding.
   b) Sketch and explain the load sensitivity of a centerboard hopper.

3. a) Define flexible automation.
   b) Explain features of flexible automation.

4. a) Explain the importance of intermittent transfer mechanism?
   b) Explain the working principle of Geneva mechanism?

5. a) Mention the reasons for stoppages of assembly process.
   b) Sketch and explain walking beam transfer system used in automated flow lines.

6. a) What is pyramid assembly? Briefly explain it.
   b) What are the common fastening methods used in manual assembly process and explain them with neat sketches.

7. Explain with suitable sketches the effect of holding down on insertion.

8. a) How the cost of various indexing machines is evaluated and implemented?
   b) What are the advantages and disadvantages of indexing machines over transfer machines from the point of cost considerations?

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