Code No:**R1642243** **R16** **Set No. 1**

IV B.Tech II Semester Regular Examinations, September - 2020

PRODUCT DESIGN AND ASSEMBLY AUTOMATION

(Automobile Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
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PART–A *(14 Marks)*

1. a) What are the limiting conditions for various modes of vibratory conveying? [2]
   b) What do you mean by out-of-bowl tooling? [3]
   c) Name the factors that affect the choice of assembly method. [2]
   d) Mention three basic design principles for feeding and orienting the parts? [3]
   e) What is DFA index? [2]
   f) Write the applications of DFA. [2]

PART–B *(4x14 = 56 Marks)*

2. a) How component parts are elevated and feed with the spiral elevator? Explain with suitable diagram? [7]
   b) Describe the effect of track acceleration and effect of track angle on the conveying velocity? [7]

3. a) How the washers, cup –shaped parts are oriented in vibratory –bowl feeder? Explain the working with suitable diagrams? [7]
   b) Explain the working of reciprocating-tube hopper with neat diagram? [7]

4. a) With suitable example, describe the effect of automation and design for assembly**?** [4]
   b) What are the basic types of assembly machines? Explain them with suitable diagrams? [10]

5. a) Describe, how British (three-pin) power plug is assembled in automatic assembly ? [7]
   b) What are the product design rules for high speed automatic assembly? Explain. [7]

6. a) What are the design features that significantly affect manual insertion and fastening times? Explain. [7]
   b) What is the effect of part weight and part symmetry on handling time during manual assembly? Explain. [7]

7. a) Describe the controller assembly with DFA method. [7]
   b) Discuss about robot assembly. [7]