**Printed Pages : 2**

**EAU023**

(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 147656**

**Roll No.**

# B. Tech.

## (SEM. VI) THEORY EXAMINATION, 2014-15

## PRODUCT DESIGN AND ASSEMBLY AUTOMATION

Time : **3** Hours] [Total Marks : **100**

***Note: Attempt all questions. Be precise in your answer. Draw neat and clean diagram where ever require.***

### Section - A

***Q.1 Attempt any four questions*:** **(5x4=20)**

a) What types of robot assembly system used in high speed automation system? Explain single station with one robot arm.

b) What are the advantages of magazines over conventional part feeders?

c) Draw the sketches for Geometrical features affecting part handling.

d) Define Flexible automation and its features.

e) If a standard Vibratory- bowl feeder cost 5000Rs after installation and debugging, that the play back period is 30 months with two shifts working, and that the factory equipment overheads are 100%(E=2) then find the rate of feeding equipment.

*Q.2 Attempt any two questions:* *(10x2=20)*

a) Explain the mechanics of vibratory conveying.

b) Discuss the various strategies' involves in automation.

c) Explain briefly the classification system for first and second digit in assembly code in manual handling system.

*Q.3 Attempt any two questions:* **(10x2 =20)**

**a)** Explain Alfa and Beta rotational symmetries for various parts.

**b)** Describe the construction and working of Reciprocating - tube hopper feeder and drive the expression of an angle required for tube of a hopper.

c) Explain Buffer storage. Give the reasons why is it used in automation lines.

*Q.4. Attempt any two questions:* *(10x2=20)*

a) What is the effect of required feed rate on feeding cost in design of parts for high speed feeding and orienting.

b) Explain the design of part for feeding and orientating in high speed automatic and assembly. Describe the rules for product design.

c) Discuss the design rules for robot assembly.

*Q.5. Attempt any two questions:* *(10x2=20)*

a) Why fusibility study is carried out on automation assembly system? Explain in brief.

b) What do you understand by term automation? Explain fixed automation and programmable automation.

c) What are the various types of indexing machines? Explain construction and working principle of rotary and inline indexing machine