Name : ……………………………………………………

Roll No. : …………………………………………………

Invigilator's Signature : …………………………………

CS/M.Tech (ME)/SEM-2/ME-1203-III(E-02)/2010

2010
MANUFACTURING AUTOMATION

Time Allotted : 3 Hours   Full Marks : 70

The figures in the margin indicate full marks.

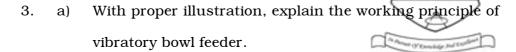*Candidates are required to give their answers in their own words as far as practicable.*

Answer any *five* question.   5 × 14 = 70

1. a) How are the transfer systems classified into different categories depending on the Assembly machines ?

    b) With suitable sketch, state the difference between continuous transfer and intermittent transfer.

    c) With suitable example, explain the working principle of a Pawl type transfer system.   4 + 5 + 5

2. a) Cite the factors affecting the choice of indexing mechanism for an assembly machine.

    b) Prove that for a Geneva disc, ratio of Active time & idle time = $(Z-2)/(Z+2)$, where Z is the number of slots in the disk.

    c) With detailed sketch, differentiate between the ratchet and pawl type of indexing mechanism with cross cam indexing unit.   4 + 4 + 6

30104 (M.TECH)   [Turn over

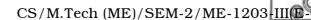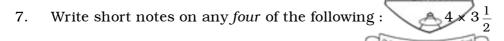3. a) With proper illustration, explain the working principle of vibratory bowl feeder.

    b) Deduce the expression for navigation of small through vibratory bowl feeder in term of normal track acceleration and acceleration due to gravity.   6 + 8

4. a) What are the commonly used feeders used in feeding of the small components ?

    b) For a reciprocating tupe hopper, how is the hopper wall inclination expressed in terms of coefficient of frication ?

                                                                          6 + 8

5. a) With suitable illustration, explain how the screw like components are delivered to the delivery chute through a fork hopper.

    b) What is a hook hopper feeder ? Elaborate the detailed procedure for design of the Hook.   6 + (2 + 6)

6. What is meant by orienting device ? Explain at least five types of orienting devices with suitable illustration.

                                                                          2 + (4 × 3)

7. Write short notes on any *four* of the following : $4 \times 3\frac{1}{2}$

    a) Orienting system

    b) Feed tracks

    c) Escapement mechanism

    d) Downtime in assembly machine

    e) Rules for product design for automated assembly.

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