Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B. Tech (ME/PE)/SEM-7/ME-701/2011-12

2011
ADVANCED MANUFACTURING TECHNOLOGY

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.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

   i) Rapid prototyping is a kind of
      a) forming process
      b) joining process
      c) generative manufacturing process
      d) finishing process.

   ii) Group technology brings together and organizes
      a) common parts, problems and tasks
      b) automation and tool production
      c) documentation and analysis
      d) parts and simulation analysis.

   iii) Feature recognition is related to
      a) Computer aided process planning
      b) Computer aided material planning
      c) Robotic welding
      d) none of these.

iv) Compared to conventional machining of metals. AWJM provides
   a) higher MRR
   b) Higher dimensional accuracy
   c) better surface finish
   d) all of these
   e) none of these.

v) Production flow analysis is a technique used in relation to
   a) assembly line balancing
   b) group technology
   c) automated inspection system
   d) all of these.

vi) Expert system is related to
   a) CMM b) CAD
   c) Al d) CNC Machines.

vii) The fundamental philosophy of CIM is
   a) Value engineering
   b) Reverse engineering
   c) Concurrent engineering
   d) Sequential engineering.

viii) The mechanism of AGV is based on the principle of
   a) triangulation
   b) interferometry
   c) embedded wire guided method
   d) none of these.

ix) MRR in ECM depends on
   a) hardness of work material
   b) atomic weight of work material
   c) thermal conductivity of work material
   d) ductility of work material.

x) Transfer lines are

a) soft automation

b) hard automation

c) flexible automation

d) all of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. a) What are the objectives of computer aided quality control ?
   b) Differentiate between hard automation and soft automation. 2 + 3
3. a) What is the working principle of a non-contact inspection method ?
   b) What do you mean by concurrent engineering ? 3 + 2
4. a) Explain composite part concept.
   b) What do you understand by Production Flow Analysis ? 2 + 3
5. a) What are the different types of flexibilities in FMS ?
   b) How is G.T. useful in FMS ? 3 + 2
6. a) Mention various elements of CIM.
   b) State the role of DBMS in CIM environment. 3 + 2
7. a) What do you mean by cloud point data in CAD ?
   b) State the salient features of solid modeling. 2 + 3

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

8. a) With simple diagrams explain the effect of various process parameters in an USM process.

b) Explain in short the various components used in USM machining unit. 7 + 8

9. a) In an electrochemical machining process with a pure iron work piece, a removal rate of 5 cm^3/min is desired. Determine the current required.
The gram atomic weight, valency and density of iron are 56 gm, 2, 7·8 gm/ cm^3 respectively.

b) In ECM process, why is electrolyte flow necessary ?

c) Explain the reasons for poor surface finish in an ECM process.

d) Discuss in short the effects of ECM on materials.
3 + 2 + 8 + 2

10. a) During an electric discharge drilling of a 10 mm square hole in a low carbon steel plate of 5 mm thickness, brass tool and kerosene are used. The resistance and the capacitance in the relaxation circuit are 50 ohm and 10 micro Farad respectively. The supply voltage is 200 volts and the gap is maintained at such a value that the discharge takes place at 150 volts. Estimate the time required to complete the drilling operation.

b) Explain any two EDM circuit for supplying pulsating *dc* current. 7 + 8

11. a) Discuss about the CAPP system.

b) Define Group Technology concept in detail.

c) What do you mean by rapid prototyping ? 8 + 5 + 2

12. a) Discuss about the co-ordinate measuring machines.

b) Describe the application of automated integration in CAD/CAM/CIM system. 7 + 8