Enrollment No......................................

Faculty of Engineering
End Sem (Even) Examination May-2022
ME3CO14 CAD / CAM / CIM

Programme: B.Tech.   Branch/Specialisation: ME

Duration: 3 Hrs.   **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Which one of them is not type of forecast: **1**
(a) Short term forecast   (b) Low term forecast
(c) Intermediate term   (d) Long term forecast

ii. MPS stand for   **1**
(a) Material programming schedule
(b) Mean production schedule
(c) Master production schedule
(d) Modern production schedule

iii. The life cycle of a product includes   **1**
(a) Extraction of natural resources   (b) Processing of raw materials
(c) Manufacturing of products   (d) All of these

iv. Total time taken by a product to reach from design stage to final assembly stage known as   **1**
(a) Process time   (b) Leg time
(c) Mean time   (d) Lead time

v. During the execution of a CNC part program block N020 G02 X45.0 Y25.0 R5.0 the type of tool motion will be   **1**
(a) Circular interpolation clockwise
(b) Circular interpolation counter clockwise
(c) Linear interpolation
(d) Rapid feed

vi. NC contouring is an example of   **1**
(a) Continuous path positioning   (b) Point-to-point positioning
(c) Absolute positioning   (d) Incremental positioning

P.T.O.

vii. Another term for a process layout is   **1**
(a) Job shop layout   (b) Functional layout
(c) Mixed model layout   (d) Group technology layout

viii. In Opitz system, 2nd digit indicates   **1**
(a) Type and Shape
(b) External shape and external shape elements
(c) External plane surface finishing
(d) Auxiliary hole and gear teeth

ix. Which of the following processes does not use lasers? **1**
(a) Cladding   (b) Alloying   (c) Nitriding   (d) Cutting

x. Lasers are also used for_____   **1**
(a) Riveting   (b) Facing   (c) Turing   (d) Rapid prototyping

Q.2 i. Explain production activity control (PAC).   **2**

ii. State the importance of batch and job shop production in modern **3**
manufacturing.

iii. What is the purpose of material requirement planning (MRP)? What is **5**
the role of MPS in MRP?

OR iv. Define CIM. Explain main elements of the CIM.   **5**

Q.3 i. Write about CAD and its application in engineering.   **2**

ii. Briefly discuss the following terms-   **8**
(a) Computer aided process planning (CAPP)
(b) Computer aided inspection (CAI)
(c) Product data management (PDM)
(d) Product lifecycle management (PLM)

OR iii. Define computer aided manufacturing. Explain the CAM hierarchy. **8**

Q.4 i. Write short note on ATC.   **3**

ii. What do you know about adaptive control system? Discuss its types **7**
and advantages.

OR iii. What is part program? How will you develop CNC part program? **7**
Explain with the help of an example.

Q.5 i. Define part family in group technology. Explain any one method of **4**
grouping parts into families.

ii. Explain following parts classification and coding system.   **6**
(a) MICLASS system   (b) DCLASS system

OR iii. Define product flow analysis. Write its steps, advantages and **6**
limitation.

Q.6   Attempt any two:

i. Describe the various stages in the development of rapid prototyping **5**
systems with highlighting the advantages and limitations.

ii. Describe the process of fused deposition modelling and list the factors **5**
that affect the part quality.

iii. Briefly explain the stereo-lithography process with neat sketch.   **5**

******

Marking Scheme
ME3CO14 CAD / CAM / CIM

Q.1 i. Which one of them is not type of forecast: **1**
(b) Low term forecast

ii. MPS stand for **1**
(c) Master production schedule

iii. The life cycle of a product includes **1**
(d) All of these

iv. Total time taken by a product to reach from design stage to final assembly stage known as **1**
(d) Lead time

v. During the execution of a CNC part program block N020 G02 X45.0 Y25.0 R5.0 the type of tool motion will be **1**
(a) Circular interpolation clockwise

vi. NC contouring is an example of **1**
(a) Continuous path positioning

vii. Another term for a process layout is **1**
(b) Functional layout

viii. In Opitz system, 2nd digit indicates **1**
(a) Type and Shape
(b) External shape and external shape elements

ix. Which of the following processes does not use lasers? **1**
(c) Nitriding

x. Lasers are also used for_____ **1**
(d) Rapid prototyping

Q.2 i. Definition of production activity control (PAC). **2**

ii. Importance of batch production **3**
0.5 mark for each (0.5 mark * 3)   1.5 marks
Importance of job shop production
0.5 mark for each (0.5 mark * 3)   1.5 marks

iii. Purpose of material requirement planning (MRP)   2.5 marks   **5**
Role of MPS in MRP   2.5 marks

OR iv. Definition of CIM   2 marks   **5**
Elements of the CIM   3 marks

Q.3 i. Definition of CAD   1 mark   **2**
Its two application in engineering   1 mark

ii. (a) Computer aided process planning (CAPP)   2 marks   **8**
(b) Computer aided inspection (CAI)   2 marks
(c) Product data management (PDM)   2 marks
(d) Product lifecycle management (PLM)   2 marks

OR iii. Definition of computer aided manufacturing   3 marks   **8**
CAM hierarchy   5 marks

Q.4 i. Explanation of ATC.   **3**

ii. Adaptive control system   2 marks   **7**
Its types and advantages
2.5 marks for each type with advantage
(2.5 marks * 2)   5 marks

OR iii. CNC part program   3 marks   **7**
An example of part programming   3 marks
Diagram   1 mark

Q.5 i. Part family in group technology   1 marks   **4**
Any one method of grouping parts into families   3 marks

ii. Explain following parts classification and coding system.   **6**
(a) MICLASS system   3 marks
(b) DCLASS system   3 marks

OR iii. Definition of product flow analysis   2 marks   **6**
Its steps with an example of matrix   2 marks
Two advantages   1 mark
Two Limitation   1 mark

Q.6 Attempt any two:
i. Stages in the development of rapid prototyping systems   **5**
3 marks
Two advantages   1 mark
Two limitations   1 mark

ii. Description of process of fused deposition modelling   **5**
3 marks
Diagram   1 mark
Two factors that affect the part quality   1 mark

iii. Stereo-lithography process   3 marks   **5**
Diagram   2 marks

*****