

**QUANTITY PRODUCTION METHOD
(MECH 4143)**

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.*

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

**Group - A
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) Tool inserts are usually made by
 - (a) Casting
 - (b) Explosive forming
 - (c) Bulging
 - (d) Powder metallurgy.
 - (ii) Final operation in the track of a ball bearing race is
 - (a) Rolling
 - (b) Turning
 - (c) Super finishing
 - (d) Grinding.
 - (iii) Quantity production of small shaft like component is best done using
 - (a) Single or Multi-spindle automat
 - (b) Milling machine
 - (c) General purpose lathe
 - (d) Machining centre.
 - (iv) For quantity production of bolts, threading can be done by
 - (a) Rolling
 - (b) Broaching
 - (c) Grinding
 - (d) Forging.
 - (v) In centreless grinding , the workpiece centre will be
 - (a) above the line joining the two wheel centres
 - (b) below the line joining the two wheel centres
 - (c) on the line joining the two wheel centres
 - (d) at the intersection of the line joining the wheel centres with the work plate plane.
 - (vi) Gear cutting by hobbing can be classified as
 - (a) rolling process
 - (b) forming process
 - (c) broaching
 - (d) generation process.

- (vii) When inspection of all products become impossible in mass production, following process is used:
 (a) Group technology
 (b) Quality function deployment
 (c) Statistical quality control
 (d) Total Productivity management.
- (viii) Mass production of cooking utensils are usually done by
 (a) metal spinning (b) deep drawing
 (c) coining (d) embossing.
- (ix) A job shop can manufacture
 (a) few type of jobs in large numbers
 (b) variety of jobs in small numbers
 (c) a particular job in small number
 (d) a particular job in large number.
- (x) Fixture is a device for
 (a) holding a work piece in machine
 (b) holding appropriate tool in machine
 (c) drilling holes in a work piece
 (d) fixing a number of loose components together.

Group - B

2. Briefly describe the following bulk deformation processes with suitable sketches:
 i. Closed Die Forging
 ii. Extrusion
 iii. Wire drawing
 Name a suitable product made by each of these processes.

4 + 4 + 4 = 12

3. (a) Classify various manufacturing processes (casting, forming and welding) indicating therein the finished products that are being manufactured against each of these processes.
 (b) Explain an input-output model for an Automobile Industry with a neat sketch.

6 + 6 = 12**Group - C**

4. (a) Describe with neat sketch the steps of production of 'connecting rod' from raw material.

- (b) Briefly explain with sketches the steps for production of 'inner race' of a ball bearing from a pipe as raw material.
6 + 6 = 12
5. (a) Discuss briefly the Gear Shaping process for manufacturing gears with suitable sketches.
 (b) Outline the steps of quantity production of "bolts" from raw materials to finished product with neat sketch.
6 + 6 = 12

Group - D

6. (a) What is the purpose of "Process Planning" ? List the information that should appear in a process planning sheet.
 (b) Explain the concept of "Group Technology" with suitable examples and sketches.
 (c) Name two classifications used in Group Technology and their respective attributes.
6 + 3 + 3 = 12

7. (a) What is a Jig and what is a fixture? Explain with suitable sketches.
 (b) With regard to fixture design, define and explain
 i. Location Surface
 ii. Support Surface and
 iii. Clamping Surface.
6 + 6 = 12

Group - E

8. (a) Illustrate the functions of the major components of a robot.
 (b) Mention the applications of a robot in respect of
 (i) transfer of materials
 (ii) machine loading and unloading.
6 + 6 = 12
9. (a) Describe the differences between mechanization and automation. Give specific examples for each.
 (b) Define and explain the 5 (five) steps of Powder Metallurgy Process. Name a component that is produced by powder metallurgy process.
4 + 8 = 12