

QUANTITY PRODUCTION METHOD
(MECH 4241)

Time Allotted: 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 4 (four) from Group B to E, taking one from each group.*

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

Group – A

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- (i) Flexible manufacturing lines are characterized by presence of
 - (a) machines with jigs and fixture that can be quickly reset
 - (b) CNC machines
 - (c) robots
 - (d) all of the above.
- (ii) Cellular manufacturing is an approach whereby production can be done in
 - (a) small batches
 - (b) medium batches
 - (c) large batches
 - (d) intermediate baches.
- (iii) Tungsten Carbide tool inserts are made by
 - (a) forging
 - (b) extrusion
 - (c) powder metallurgy
 - (d) casting.
- (iv) For quantity production of bolts, threading can be done by
 - (a) rolling
 - (b) broaching
 - (c) grinding
 - (d) forging.
- (v) In which layout manufacturing is done according to machine arrangement?
 - (a) GT layout
 - (b) Process layout
 - (c) Product layout
 - (d) Hybrid layout.
- (vi) Type of chuck used in bar fed automatic lathe is
 - (a) collet
 - (b) 3-jaw
 - (c) 4-jaw
 - (d) floating centre.
- (vii) Machining is a
 - (a) forming process
 - (b) removal process
 - (c) regenerative process
 - (d) joining process.
- (viii) Grouping of different parts having similar geometric shapes and size is done based on concept of
 - (a) statistical quality control
 - (b) total productivity
 - (c) quantity production
 - (d) group technology.

- (ix) Eccentric pin of a crank shaft can be machined by
 (a) turning (b) milling
 (c) turn broaching (d) all of above.
- (x) Car bodies are made out of
 (a) hot rolled sheet (b) cold rolled sheet
 (c) cold rolled plates (d) hot rolled plates.

Fill in the blanks with the correct word

- (xi) Gear cutting by hobbing can be classified as _____.
- (xii) _____ cannot be machined by EDM.
- (xiii) When inspection of all products become impossible in mass production _____ process is used.
- (xiv) Mass production of cooking utensils are usually done by _____.
- (xv) T-joints used in piping work is usually made by the process of _____.

Group - B

2. (a) Describe the characteristics of
 (i) flow production (ii) just-in-time production. [[CO1](Remember/LOCQ)]
 (b) What are the advantages and disadvantages of those types of production? [[CO1](Understand/LOCQ)]
(3 + 3) + 6 = 12
3. Briefly describe the following Bulk Deformation Processes with a suitable sketch and name a suitable product made by each of these following processes:
 (i) Extrusion (ii) Wire drawing. [[CO1](Analyse/HOCQ)]
(6 + 6) = 12

Group - C

4. (a) Describe with a neat sketch the production sequence of a crank shaft. [[CO3](Analyse/HOCQ)]
 (b) Illustrate briefly the various steps of quantity production of 'Hexagonal Bolts'. [[CO4](Remember/LOCQ)]
6 + 6 = 12
5. (a) Classify various manufacturing processes (casting, forming and welding) indicating there in the finished products that are being manufactured against each of these processes. [[CO3](Analyse/IOCQ)]
 (b) Explain the steps that are followed from the raw material to the finished stage with a line sketch for manufacturing a passenger car. [[CO2](Apply/IOCQ)]
6 + 6 = 12

Group - D

6. (a) How is a hole in a component being manufactured in large quantity inspected? [[CO3](Analyse/HOCQ)]
(b) What is the purpose of “Process Planning”? List the information that should appear in a process planning sheet. [[CO4](Remember/LOCQ)]
(c) Differentiate between the terms “Inspection” and “Quality Control”. [[CO2](Apply/IOCQ)]
3 + 6 + 3 = 12
7. (a) What is a Jig and what is a fixture? [[CO3](Analyse/HOCQ)]
(b) Prepare a typical ‘Process Planning sheet for manufacturing a cylindrical pin (38+/-0.02mm dia x 60+/-0.5 mm long) from a rod showing all the information that should appear in it.
(c) Define and elaborate the followings related to fixture design
(i) Location surface
(ii) Support surface
(iii) Clamping surface. [[CO4](Remember/LOCQ)]
3 + 7 + 2 = 12

Group - E

8. (a) Identify and briefly describe the three basic components of a numerical control system. [[CO5](Remember/LOCQ)]
(b) Briefly explain the functions of four major components of an Industrial Robot. [[CO5](Understand/HOCQ)]
6 + 6 = 12
9. (a) What is meant by 'Powder Metallurgy' ? [[CO6](Analyse/HOCQ)]
(b) State the advantages and limitations of ‘Powder Metallurgy’. [[CO6](Remember/LOCQ)]
(c) Discuss in brief the steps of production of Ceramic Products. [[CO6](Remember/LOCQ)]
2 + 4 + 6 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	54.2	12.5	33.3

Course Outcome (CO):

After completion of the course, the students will be able to:

- C01 Plan and implement various manufacturing systems and processes
C02 Apply mass manufacturing knowledge for manufacturing common engineering items.
C03 Apply different production process knowledge for manufacture of complex engineering items.
C04 Improve productivity and quality through application of planning, group technology and quality control
C05 Improve productivity through application of automation, robots and CNC machines in production
C06 Implement various non-conventional and emerging production technique

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question.

