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) Which of the following is not a heat treatment proces
(a) normalising (b) tempering
(c) honing (d) annealing

(ii) Mass production of cooking utensils are usually done by
(a) metal spinning (b) deep drawing
(c) coining (d) embossing

(iii) For quantity production of bolts, threading can be done by
(a) rolling (b) broaching
(c) grinding (d) forging

(iv) Gear cutting by hobbing can be classified a
(a) shaping process (b) milling process
(c) forming process (d) generation process

(v) Grouping of different parts having similar geometric shapes and size is done based on the concept of
(a) quantity production of technology (b) total productive maintenance
(c) statistical quality control (d) group technology

(vi) Activity that involves selection of manufacturing process, machine tool, toolings, fixtures, process parameter etc. Is called
(a) production planning (b) process scheduling
(c) process planning (d) production scheduling

(vii) In powder metallurgy, the strength of the green compact is achieved by
(a) tempering (b) blending
(c) sintering (d) quenching

(viii) Tool inserts are usually made by
(a) casting (b) explosive forming
(c) bulging (d) powder metallurgy

(ix) Ceramics are typically made of
(a) organic compounds
(b) inorganic compounds
(c) long chains of repeating molecules
(d) weaker intermolecular forces between chains

(x) An engine block is usually manufactured in
(a) multi spindle automatic lathe (b) transfer line
(c) machining center (d) machining cell

Fill in the blanks with the correct word

(xi) T –joint in piping work is usually made by the process of _____.

(xii) Feed rate in turning operation is expressed by _____ per _____.

(xiii) Fixture is a device for _____ a _____ _____ in machine.

(xiv) Flexible Manufacturing System (FMS) generally consists of _____ or _____ number of individual machines.

(xv) Eccentric pin of a crankshaft can be machined by _____.

Group - B

2. (a) Mention the factors that influence he choice of manufacturing system. *[(CO1)(Remember/IOCQ]*

(b) Discuss the characteristics, merits & demerits of Just-In-Time Production. *[(CO1)(Remember/IOCQ]*

6 + 6 = 12

3. Briefly discuss the following bulk deformation processes with suitable sketches (any two).
(i) extrusion (ii) wire drawing (iii) closed forging. *[(CO1)(Remember/IOCQ]*

(6 + 6) = 12

Group - C

4. (a) Describe with neat sketch the steps of quantity production of “Hexagonal Bolts” from raw material. *[(CO2)(Analyse/HOCQ)]*

(b) Explain the process of production of Spur Gears by “Gear Shaping” . While doing so, explain the cutting process with sketches of the following :
(i) the shape of cutting tool
(ii) relative position of cutter and gear blank
(iii) motions of the cutter and the job. *[(CO3)(Remembere/IOCQ]*

6 + 6 = 12

5. (a) Briefly explain with sketches the steps the steps for production of "inner race" of a ball bearing. *[(CO2)(Analyse/HOCQ)]*

(b) Describe with neat sketch the steps of production of "connecting rod" from raw material. *[(CO3)(Remember/IOCQ]*

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. *[(CO4)(Remember/LOCQ)]*

(b) Explain the concept of "Group Technology" with suitable examples and sketches. *[(CO4)(Remember /LOCQ)]*

(c) Name two classifications used in group technology and their respective attributes. *[(CO4)(Remember/IOCQ]*

4 + 4 + 4 = 12

7. (a) Differentiate between the terms "Inspection" and "Quality Control". *[(CO4)(Remember/LOCQ)]*

(b) Illustrate the concept of UCL, CL and LCL in the context of Statistical Process Control. *[(CO4)(Remember/LOCQ)]*

(c) What are the advantages and disadvantages of "Flexible CNC Machining System" and "Transfer Line"? *[(CO5)(Analysis/IOCQ]*

(3 + 3) + 6 = 12

Group - E

8. (a) Identify and briefly describe the three basic components of a numerical control systems. *[(CO5)(Remember/LOCQ)]*

(b) Briefly explain the functions of four major components of an industrial robot. *[(CO5)(Remember/IOCQ]*

6 + 6 = 12

9. (a) Discuss in brief, the steps of production of ceramic products. *[(CO6)(Analyse/HOCQ)]*

(b) Mention the advantages of Powder Metallurgy over conventional metal fabrication. *[(CO6)(Analyse/HOCQ)]*

6 + 6 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	20.83	54.17	25