

Con. 7644-12.

(3 Hours)

KR-5408

[ Total Marks : 100

- N. B. :** (1) Question No. **1** is **compulsory**.  
 (2) Answer any **four** questions out of remaining **six** questions.  
 (3) **Figures** to the **right** indicates **full** marks.  
 (4) Assume **suitable** data wherever **necessary**.

- Q.1 a) State and explain following concepts in product design: 06  
 1) Reverse Engineering 2) Standardization 3) Robust Design  
 b) Differentiate between products & services. 06  
 c) Explain brazing process with neat sketch. Write benefits & limitations of brazing with respect to other metal joining processes. Also write its applications. 08  
 Q.2 a) Draw block diagram of Lathe machine & name at least 8 important parts. 08  
 b) Differentiate along with neat sketches between turning operation & facing operations. 04  
 c) Explain rolling process with neat sketch. Write benefits & limitations of rolling with respect to other metal working processes. Also write its applications. 08  
 Q.3 a) Differentiate along with neat sketches of relative motion between work piece & tool for milling machine & shaper machine. 06  
 b) Discuss the important properties because of which plastics find wide applications. Also state its limitations. 06  
 c) Define operation planning & explain the steps involved in preparing an operation sheet. 08  
 Q.4 a) Define quality & explain its dimensions. 06  
 b) The number of rust spots found in each sample of sheet metal of 01 Sq. ft. area is noted down as follows. Draw the appropriate control chart and state if the process is in control or not. 06

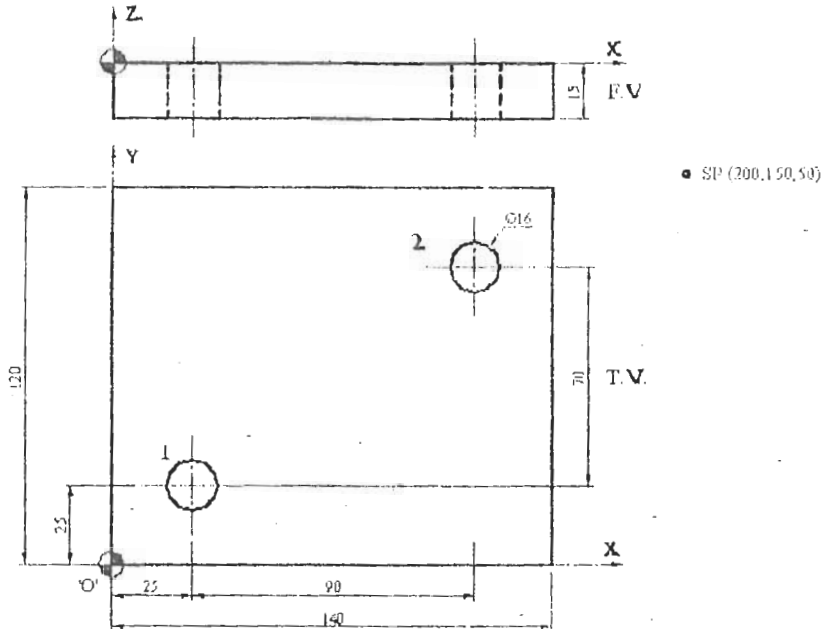
Sample Number	1	2	3	4	5	6	7	8	9	10
Number of defects found	7	9	6	9	5	8	7	10	8	6

- c) Write note on robot co-ordinate systems. 08  
 Q.5 a) Differentiate with neat representative sketches, the following basic types of motion controls in CNC machines. 06  
 1) Point to **point** 2) Straight cut 3) Contouring cut.  
 b) List advantages & limitations of Flexible Manufacturing System. 06

[ TURN OVER

e) Write a CNC program for drilling operation for the figure given below.

08



Q.6 a) Explain the principles of Hand tool design.

08

i) The table below shows two layout options of a facility. The distance between any two adjacent departments is 15m. No diagonal movement of materials is possible. For eg., if a load has to be moved from department 7 to department 5 in layout A, it can either be through department 8,9, and 6 or through department 3,1, and 2 by traveling a distance of 60m. The table below also shows the department processing sequence of various products and their quantity produced per month.

08

Which layout is better in terms of lower total load-distance value?

Layout A

1	2	3
4	5	6
7	8	9

Layout B

5	3	4
9	6	1
2	7	8

Product	Department Processing Sequence	Quantity per month
V	3-7-2-9	3,000
W	2-6-3-7-8-9	1,000
X	1-2-7-8	2,000
Y	5-2-1-7-9	4,000
Z	3-4-7-8-9	1,000

c) Write note on types of capacities.

04

Q.7 Write notes on any four.

20

- 1) Master production schedule
  - 2) Role of demand management in assemble to order environment.
  - 3) KANBAN
  - 4) Wastes identified in JIT
  - 5) ERP
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