T.E. (IT) Sem V (R)
Manufacturing Processes, Planning & Systems

Con. 5488-09. (REVISED COURSE) SP–8648

21/12/09

(3 Hours) [Total Marks : 100

2-30 to 5-30

N. B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) Illustrate answers with sketches, wherever **required**.

1. (a) Explain with a neat diagram the main parts of a Lathe. 10
(b) Define the terms : Quality, Quality Control and Total Quality Management. 6
(c) Define ergonomics and explain its importance in manufacturing. 4

2. (a) List the various operations done on a milling machine and explain any three. 6
(b) What is resistance welding ? Explain any one resistance welding process. 8
(c) Define operations planning. Explain the process of making an operation sheet. 6

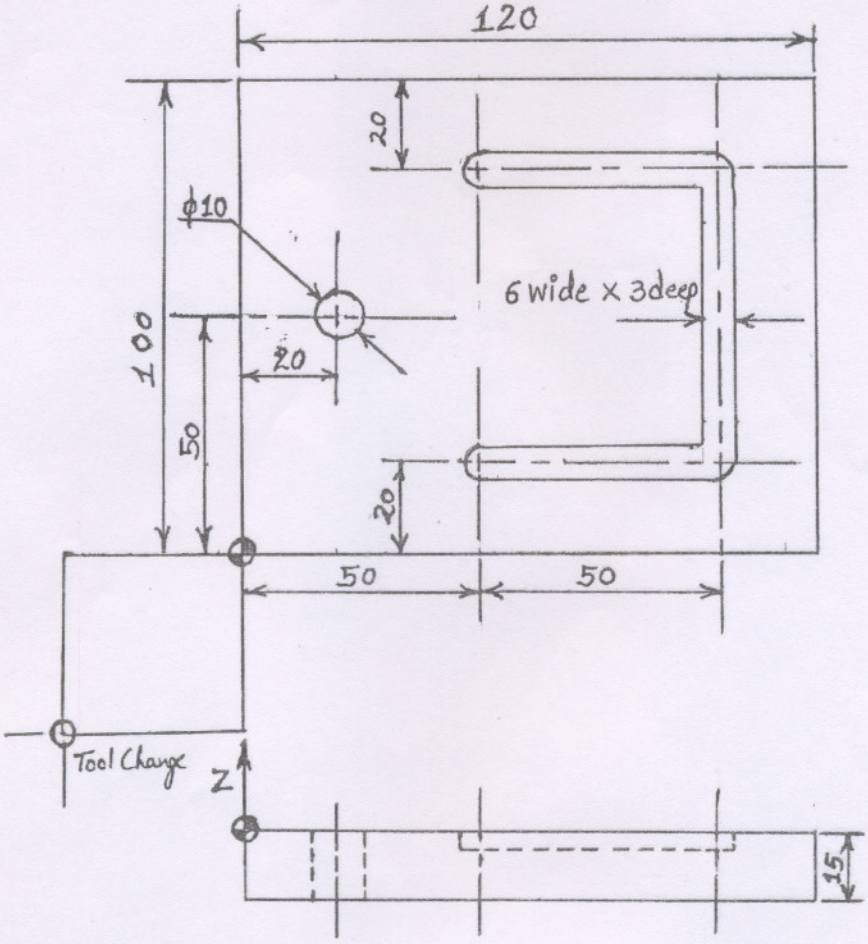
3. (a) Plot the $\overline{X}$ and R control charts for the following data. Sample size is 5. From the chart find out whether the process is out of control. Take $d_2 = 2{\cdot}326$ 10

Sample No.	1	2	3	4	5	6	7	8	9	10
$\overline{X}$	5·004	5·204	5·014	5·008	5·009	5·016	5·030	6·010	5·016	5·010
R	0·02	0·08	0·03	0·05	0·04	0·09	0·04	0·04	0·05	0·07

(b) Explain Histogram as a tool for 'Total Quality Management'. 5
(c) Explain the importance of designing a workplace. 5

4. (a) What is a CNC system ? Explain. 5

(b) Prepare a CNC part programme for milling a slot of 6 wide x 3 deep and drilling a hole as shown in the drawing below. (Manual Part programme using G & M codes.) 10



The spindle speeds (rpm) and feed rates (mm/min) for different operations are as follows :—

Centre drilling — 1500 rpm & 120 mm/min
Drilling — 1100 rpm & 100 mm/min
Milling — 800 rpm & 100 mm/min (Vertical)
350 mm/min (horizontal)

(c) Explain transformation process with a suitable example. 5

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5. (a) Explain injection moulding process with a neat diagram. 5
   (b) What are the different types of plastics ? State properties of plastics ? 5
   (c) Explain a flexible manufacturing system (FMS). 10

6. (a) What is optimal capacity of a facility ? Explain. 5
   (b) How many types of basic layouts are there for a facility ? Explain any one stating its advantages. 10
   (c) Define a Robot and explain its major components. 5

7. (a) Discuss the role of demand management in sales and operations planning. 6
   (b) Explain in brief the Make-to-Stock (MTS) manufacturing environment. 4
   (c) Write short notes on any **two** of the following :— 10
      (i) Hot Rolling
      (ii) Materials Requirement Planning
      (iii) Just in time.
