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I N D E X

Sr. No.	Experiment Description	Experiment Date	Submission Date	Remarks/Signatures
01.	Using linear and circular interpolation create a part program and produce component in machine. Page No. 01. to 04.			
02.	To create a part program for multiple turning operations & produce component in the machine. Page No. 05. to 07.			
03.	To create a part program for grooving & produce component in machine. Page No. 07 to 09.			
04.	To create a part program for mirroring and produce component in the machine. Page No. 10. to 11.			

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Sr. No.	Experiment Description	Experiment Date	Submission Date	Remarks/Signatures
05.	To create a part program for drilling and tapping and produces component in the machine. Page No. 12. to 14.			

Experiment No 1

Part I

AIM: Create a part program using linear motion / interpola-tion and produce component in the machine.

MATERIAL REQUIRED

Material : Aluminium
Size 100 mm (L) x 100 mm (W) x 10 mm (T)

PLANNING & OPERATION TABLE

Billet Size - 100x100x10 Material - Aluminium
Program No. - 1 DWG No. - 1

Sl No.	Operation	Tool dia, mm	Tool type	Tour st No	Tool length offset No.	Spindle speed rpm	Feed mm/
01.	Countouring	5	Slot cutter	1	1	1500	30-60

Program

O0002
G21 G94
G91 G28 X0 Y0 Z0
M06 T01
M03 S1500


100 mm

```
G90  G00  X 25  Y25 Z25
G01  Z-1   F50
G01  X75
G01  Y75
G01  X 25
G01  Y 25
G00  Z5
G91  G28  X0 Y0 Z0
M05
M30
```

Result

Thus, the manual part program was written and executed in CNC milling.

PART - II

Aim : Create a part program using circular interpolation & produce component in the machine.

Material Required :

Material : Aluminium
Size : 100 mm (l) x 100 mm (w) x 10 mm (T)

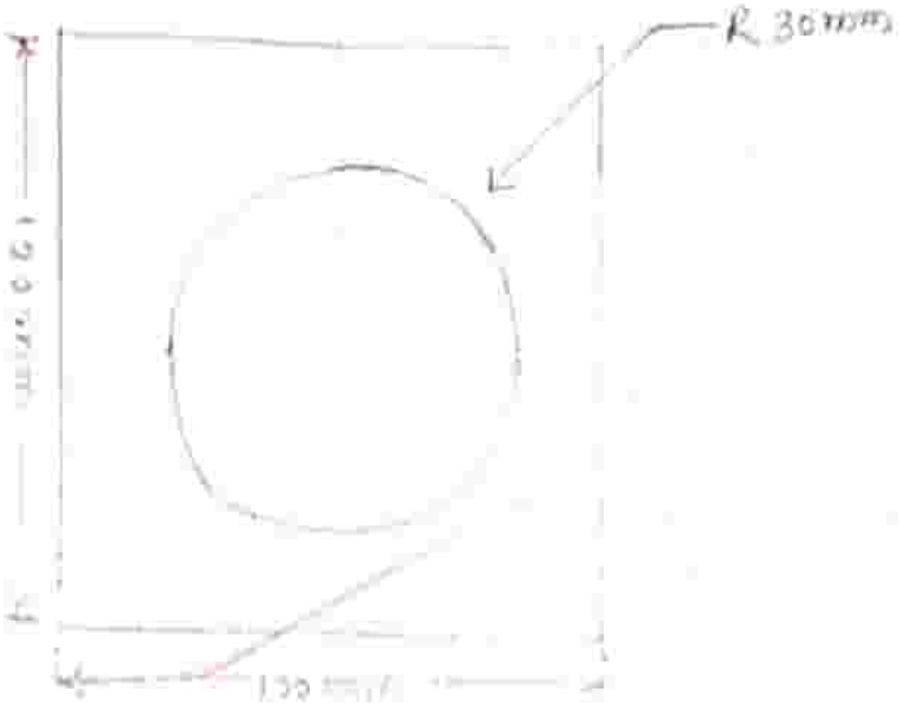
Planning and operation Table :

Billet Size - 100 x 100 x10 Material - Aluminium
Program No - 02 DWG No. - 02

Sl No.	Operation	Tool type	Tool dia in mm	Tool st. No	Tool length offset No	Spindle Speed rpm	feed mm/min
01.	Countouring	Slot cutter	5	1	1	1500	30-50

Program :

```
O0003
G21 G94
G91 G28 X0 Y0 Z0
M06 T01
M03 S1500
G90 G00 X35 Y0 Z5
G01 Z-1 F30
G02 X-35 Y0 R 35
G02 X 35 Y0 R35
```


R 30mm

G00 Z 5
G91 G28 X0 Y0 Z0
M05
M30

Result :

Thus, the manual part program was written and executed in CNC milling.

Experiment No. 02

Aim : To create a part program for multiple turning operations and produce component in the machine.

Material Required :

Material - Aluminium
Size - Length 70 mm, Diameter 22 mm

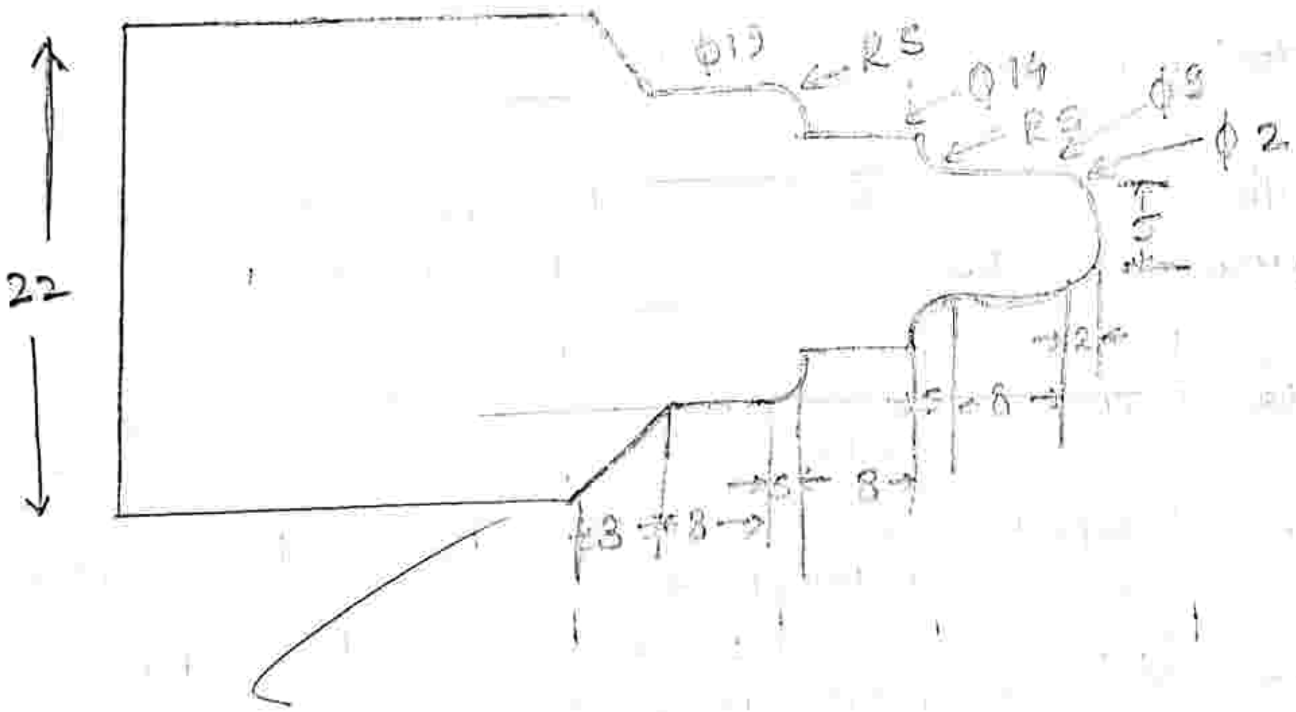
Planning and operation Sheet :

Billet Size - 22 × 60 Material - Aluminium
Program No - 03 DWG No - 03

Sl no	Operation	Joul type	Joul dia in mm	Joul St. No.	Joul Offset No.	Spindle Speed rpm	feed mm/min
01.	Multiple Rough Turning	SDJCR 121H11	DCMT11 T304	1	1	1200	35
02.	Finishing	SDJCR 121H11	DCMT 11T302	2	2	1450	25

Program :

```
O000
G21 G98
G28 V0 W0
M06 T0303
M03 S1200
G00 X22 Z2
```


22
ϕ19
R5
ϕ14
R5
ϕ9
ϕ2
5
2
5
8
5
8
3
8

```
G71  U05  R1
G71  P10  Q20  U0.1  W0.1  F45
N10  G00  X7  Z0
G01  X9  Z-2
G01  Z-10
G02  X14  Z-15  R-5
G01  Z-23
G03  X19  Z-28  R5
G01  Z-36
N20  G01  X22  Z-39
M03  S1600  F30
G70  P10  Q20
G28  U0  W0
M05
M30
```

Result :

Thus, the manual part program was written and executed.

EXPERIMENT NO. 03

Aim: To create a part program for groving and produce component in the machine.

Material required :-

Material - Aluminium
Size - length 70 mm, Diameter 28 mm

Planning and operation sheet :

Billet Size- Material -
Program No - DWG No -

Gl No.	Operation	Joul type	Joul dia. mm	Joul st. No.	Joul ofst No.	Spindle speed rpm	feed mm/rev
01.	Multiple Rough Cutting	SDJCR121 HII	DCMT11T 304	1	1	1200	35
02.	Finishing	SDJCR121HII	11	2	2	1450	25
03.	Grooving	HGS	3mm width	5	5	750	15


Φ10
Φ15
Φ13
Φ10

Program :-

```
00005
G21  G98
G28  U0 W0
M06  T03
M03  S1200
G00  X22 Z2
G71  U0.5 R1
G71  P10  Q20 U0.1 W0.1 F45
N10  G01  X8  Z0
G01  X10  Z-3
G01  Z-16
G01  X13
G01  X15 Z-19
G01  Z-24
G03  X20 Z-29 R5
G01  Z-36
N20  G01 X22 Z-39
M03  S1600
G70  P10 Q20 F30
G28  U0 W0
M06  T0707
M03  S600
G00  X10.5 Z-2
G75  R1
G75  X7 Z-10 P100  Q1000 F40
G28  U0 W0
M05  M30
```

Result :-

Thus the manual part program was written and executed in the CNC Lathe.

EXPERIMENT NO. 04

Aim :- To create a part program for mirroring operation and produce component in the machine.

Material Required :-

Material - Aluminium

Size - 100 mm (l) x 100 mm (w) x 10 mm (tall)

Planning and Operation Sheet :-

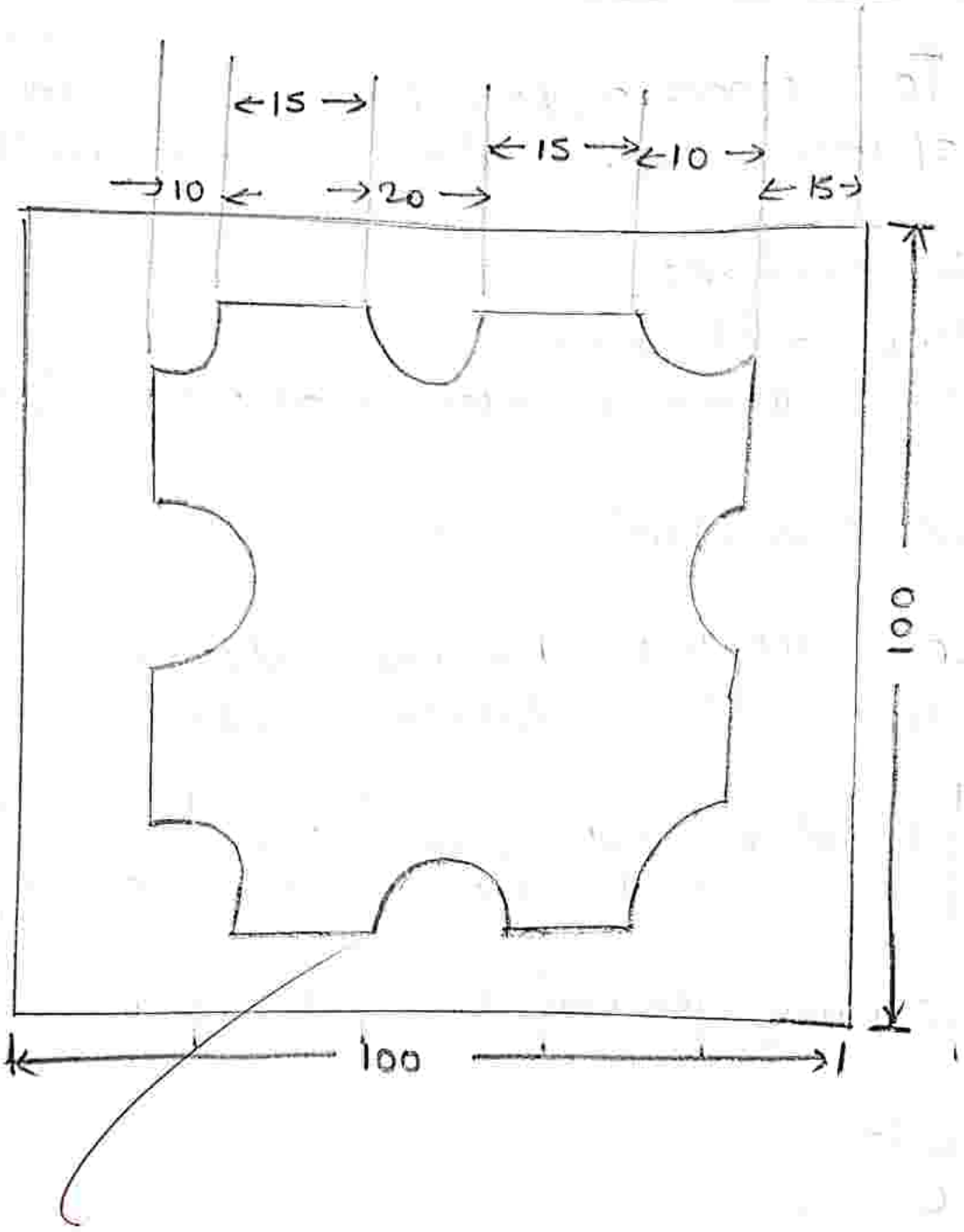
Billet Size - 100 x 100 x 10 Material - Aluminium

Program No. - 05 DWG No - 05

Sl No.	Operation	Joul typ	Joul dia, mm	Joul St No.	Joul ofset No	Spindle speed rpm	feed mm/min
01.	Countering	Slot cutter	5	1	1	1500	30-50

Program :-

```
00010
G21 G94
G91 G28 X0 Y0 Z0
M06 T11
M03 S1200
G90 G00 X0 Y0 Z5
M98 P001 3535
M70
M98 P001 3535
```


15
15
10
10
20
15
100
100

```
M81
M91  G28 X0 Y0 Z0
M05
M30
:3535
G00 X25 Y0 Z5
G01 Z-1 F30
G02 X 35 Y25
G02 X25 Y35 R10
G01 X10 Y35
G02 X25 Y35 R10
G01 X10 Y35
G02 X0 Y25 R10
G00 Z5
M99
```

Result :-

Thus, the manual part program was written to the required dimensions and executed in CNC milling.

Experiment No. 05

Aim : To create a part program and produce a component for –

(i) Drilling Operation

Material Required :-

Material – Aluminium
Size – length 100 mm, Width 100mm, 10mm(T)

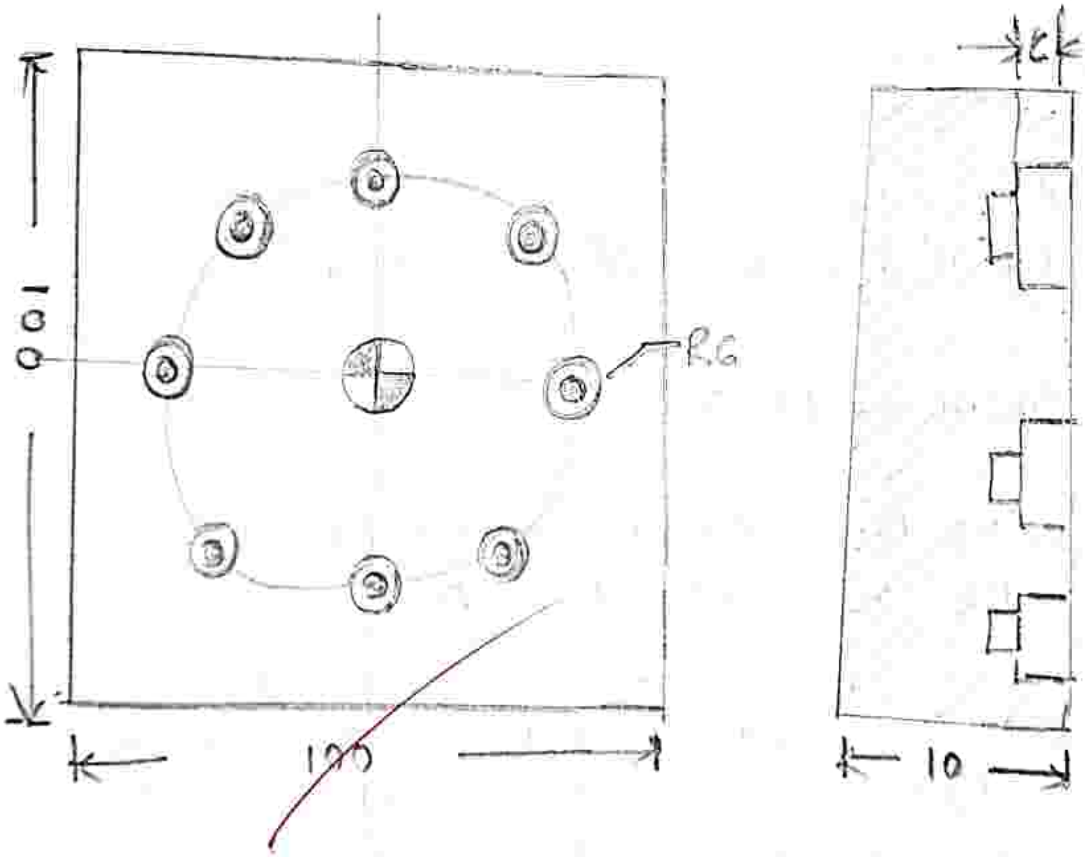
Planning & Operation Sheet :-

Billet Size 100×100×10 Material - Aluminium
Program No. - 06 DWG No - 06

Sl No.	Operation	Tool type	Tool dia mm	Tool st. No	Tool ofset No	Spindle speed, rpm	feed mm/min
01.	Drilling	Slot drill	6	1	1	1500	35
02.	Drilling	slot dril	10	2	2	1500	35

Program :-

```
O0009
G21 G94
G91 G28 X0 Y0 Z0
M06 T11
M03 S1500
```


100
100
R.C
2
10

G90 G00 X0 Y35 Z5
G38 P001 2525
G91 G28 X0 Y0 Z0
M05
M06 T01
M03 S1500
G90 G80 X0 Y35 25
G98 G81 X0 Y35 Z-3 R2 F35
M98 P001 2525
G91 G28 X0 Y0 Z0
M05
M30
: 2525
X 24.74 Y-24.74
X35 Y0
X24 .74 Y24.74
X-35 Y0
X-24.74 Y24.74
G00 Z10
G80
M99

Result :-

Thus, manual part program of drilling was written and excuted in CNC milling.

(11) Tapping operation

Program :-

```
N5  T0505 (M5 TAP)
M06
G90  G95  G54  G21  G17  G80
S300
G00  X 20.0  Y 20.0
Z15.0  M08
G84  Z-12.0  R5.0  Q3.0  F0.8
  X 50
  x 50
  Y 40
  G80
G00  Z50  M09
G53 X0  Y0  Z0
M01
```

Result :-

Thus, manual part program of tapping was written and executed to CNC Milling