

Please Answer The Following Questions:-

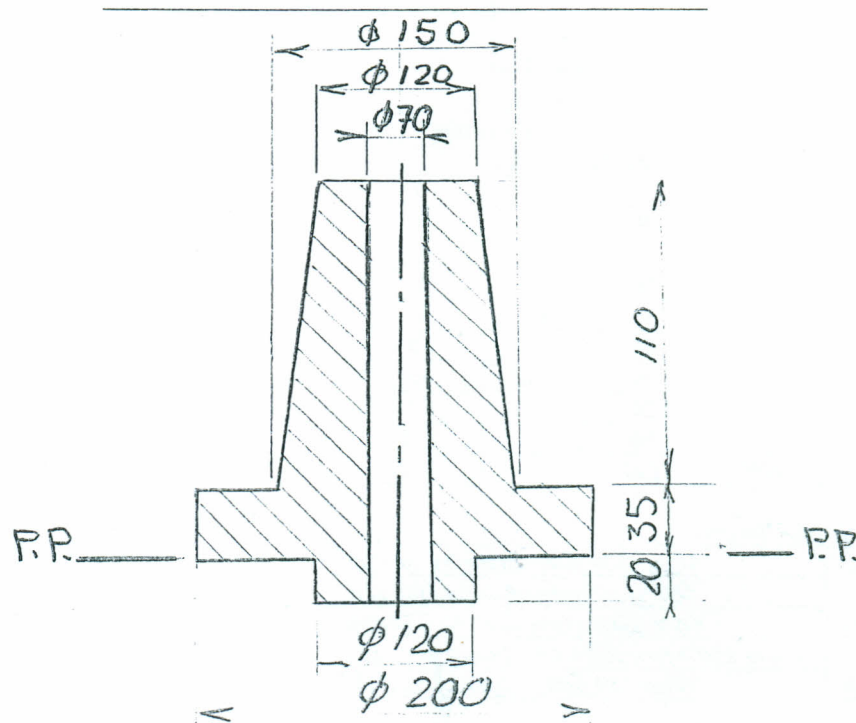
" Provide clean and Neat Sketches:"

WELDING PART [45Marks]

- Q1-a) Describe the appearance and properties of (i) *Neutral flame*, (ii) *Carburizing flame*, and (iii) *Oxidizing flame*. [5 Marks]
-b) What is the difference in *FOREHAND* and *BACKHAND* gas welding technique? [5 Marks]
-c) What are the advantages of *BRAZING* welding? [5 Marks]
-d) Why the *PICKLING* is very important step for *Brazing* and *Soldering* welding processes? [5 Marks]
- Q2-a) Explain the process of *STUD ARC* welding with a neat sketch, and explain how it is different from other arc welding processes? [8 Marks]
-b) Explain how a tube can be manufactured from sheet by a suitable welding process? [5 Marks]
-c) What are the *BUTT* and *LAP pressure welding processes*? [5 Marks]
-d) Explain precisely the *heat source* in *LASER* welding process? [7 Marks]
-e) Describe the *TRANSFER ARC PLASMA* torch principle? [5 Marks]

CASTING PART [45 Marks]

- Q1-a) List the main advantages of the casting process? [5 Marks]
-b) State the difference between *semi-centrifuge* and *true centrifuging* casting. [5 Marks]
-c) Compare *precision investment* casting and *shell moulding* from the stand point of *process*, *product*, *accuracy* and *applications*. [5 Marks]
-d) What are the major limitations of the *Die* casting? [5 Marks]
- Q2-a) Describe the *carbon dioxide moulding* process. [5 Marks]
-b) Explain the use of the *chill* with an example. [5 Marks]
-c) Design the *Gating and Risering systems* for the Aluminum alloy medium size part as shown in the Figure, where $\gamma_{AIL} = 2.68 \text{ g/cm}^3$, $\gamma_{AIS} = 2.7 \text{ g/cm}^3$, $\mu = 0.28$, $t_{av} = 9\text{mm}$. [15 Mark]



All Dimensions in mms.

"Prof. Dr. Eng." M. SAMUEL & Tawfik Elmedani [Best Wishes]

Table (1) Gating Ratio

Material	Area of Spure	Area of Runner	Area of Ingat
Cast Iron	4	3	2
Steel	1.11	1.06	1.0
Aluminum alloy	1.0	3.0	3.0

Table (2) Shrinkage Allowances

Pouring Material	Shrinkage %
Carbon Steel	1.81-2.0
Mangan. Steel	2.2-2.4
C.I (Thin)	1.0-1.25
C.I (Thick)	0.5-1.0
Aluminum Alloys	1.25
Zink	1.5
Bronze	1.5
Tin	0.5

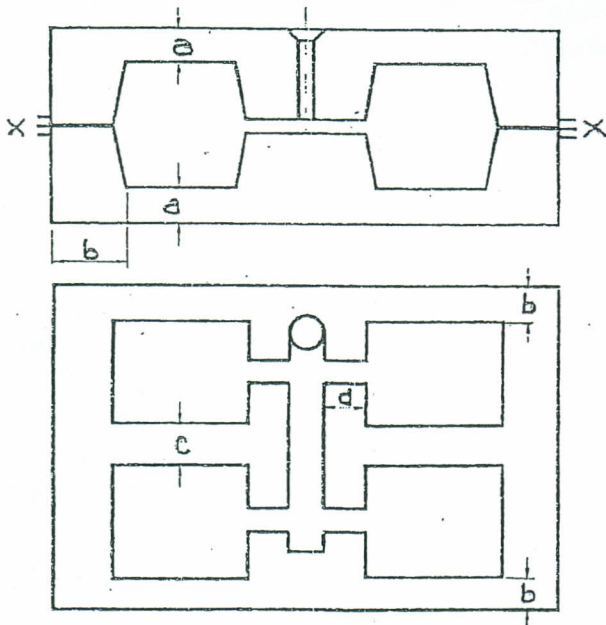


Table (3) Machining Allowances

Casting Size mm	Allowances (mm)		
	Upper Surface	Surface	Inner Surface
Cast Iron			
Up to 150	5	3	3
150 - 300	6	3	3
300 - 500	6	5	6
500 - 900	8	5	6
900-1500	4	6	8
Ingots Steel			
Up to 150	6	3	3
150 - 300	6	5	6
300 - 500	8	6	6
500 - 900	10	6	7
900 - 1500	13	7	8
Non-Ferrous Metals			
Up to 75	2	2	2
75 - 200	3	2	3
200-300	4	2	3
300-500	4	3	3
500-900	5	4	4
900-1500	6	4	4

Table (4) S Factor

Average Thickness (mm)	Small Casting	Medium Casting	Heavy Casting
2.5-4.0	1.1	1.55	--
4.0-8.0	1.25	1.77	--
8.0-16	1.5	2.12	--
30-50	1.75	2.24	0.5
80-120	--	--	0.8
230-300	--	--	1.7
300-600	--	--	2.6

Table (5) Distance between Flask and Mould cavity

Casting Weight (Kg)	The Distance (mm)			
	a	b	c	d
Up to 5	40	30	30	30
5 - 10	50	40	40	30
10 - 25	60	50	50	30
25 - 50	70	50	60	40
50 - 100	90	60	70	50
100-250	100	70	100	60
250-500	120	80	--	70
500-1000	150	90	--	120
1000-2000	200	100	--	150

Table (6) Flask Dimensions

Length and Width of Gating System	Up to 500 mm - steps by 50 mm
	500-1000 mm- steps by 100 mm
	Over 1000 mm- steps by 200 mm
Height Of Gating System	Up to 100 mm - steps by 10 mm, than 120, 150 mm
	Over 150 mm - steps by 50 mm

RISERING CURVE

