

DNPL EL/TM/007

B

NATIONAL INSTITUTE NORTHERN ACCELERATOR.

R.F. PARAMETERS

by

D. J. Thompson

D. N. P. L.
17 SEP 1973
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National Institute for Research in
Nuclear Science.

Electron Laboratory.

8th April, 1963.

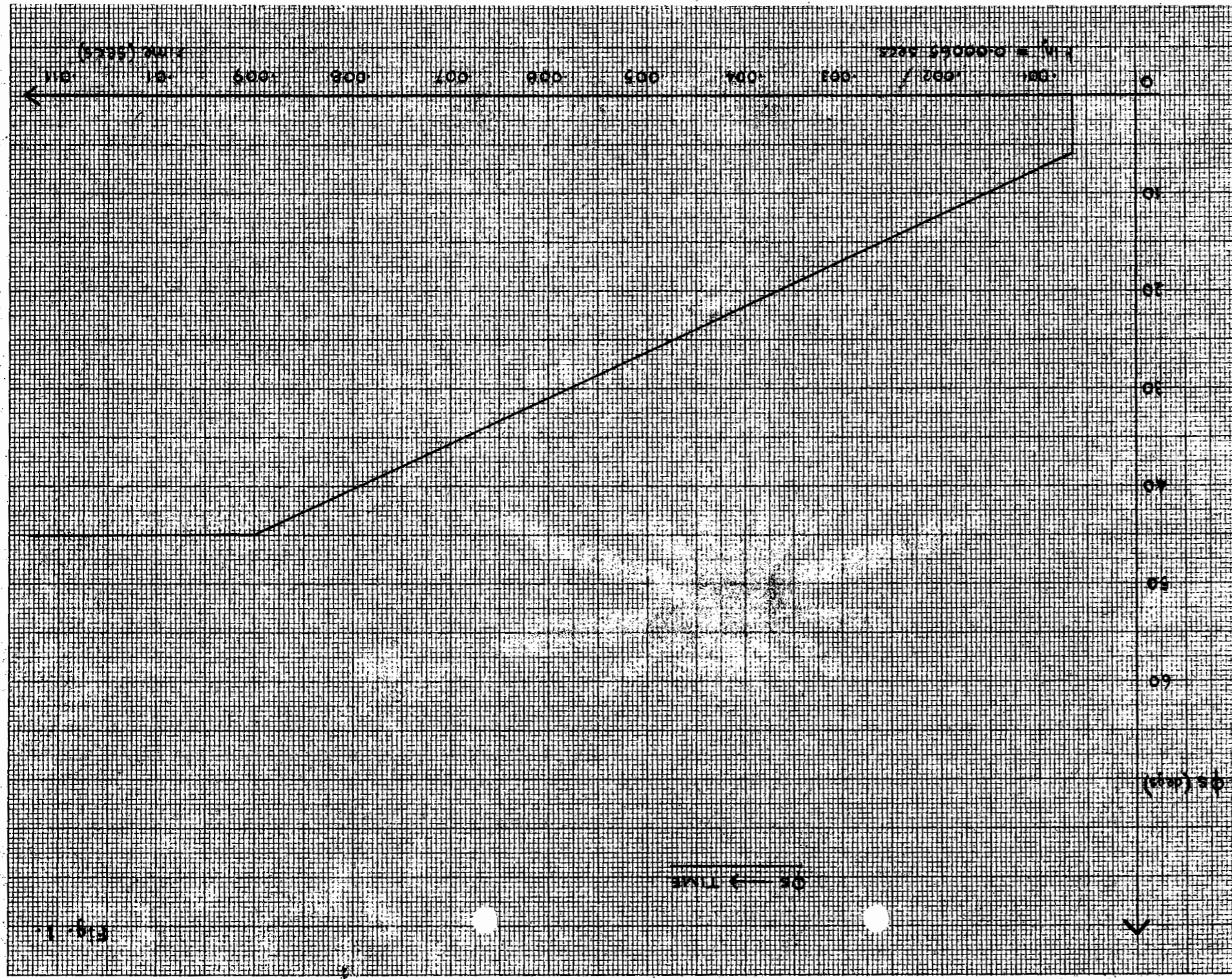
4. Table of Parameters.

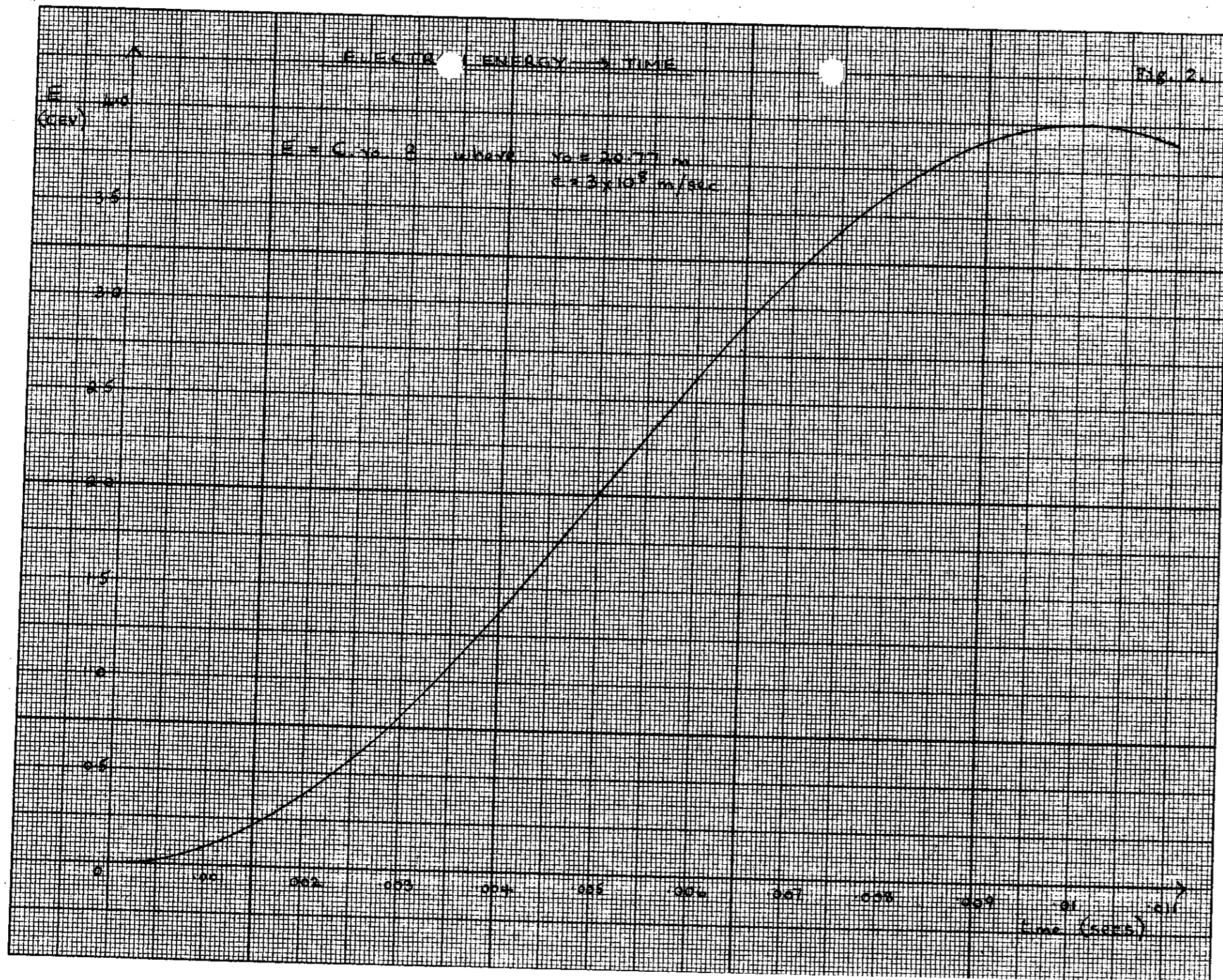
a)	NINA		DESY		CEA	
	4	5	6	7.5	6	GeV
Machine Energy						
Circumference	220.50		316.79		226.5	m
Harmonic No.	300		528		360	
Radius of Curvature	20.77		31.70		26.2	m
R.F. frequency	408.0		499.67		475.83	mc/s
Orbital frequency	1.360		0.9463		1.322	"
Pk radiation loss/turn	1.10	2.68	3.62	8.83	4.5	MeV
Free space wavelength	73.5		60		63	cm
Guide wavelength	101.3		79.5		87	cm
Momentum compaction	0.0453		0.037		0.031	

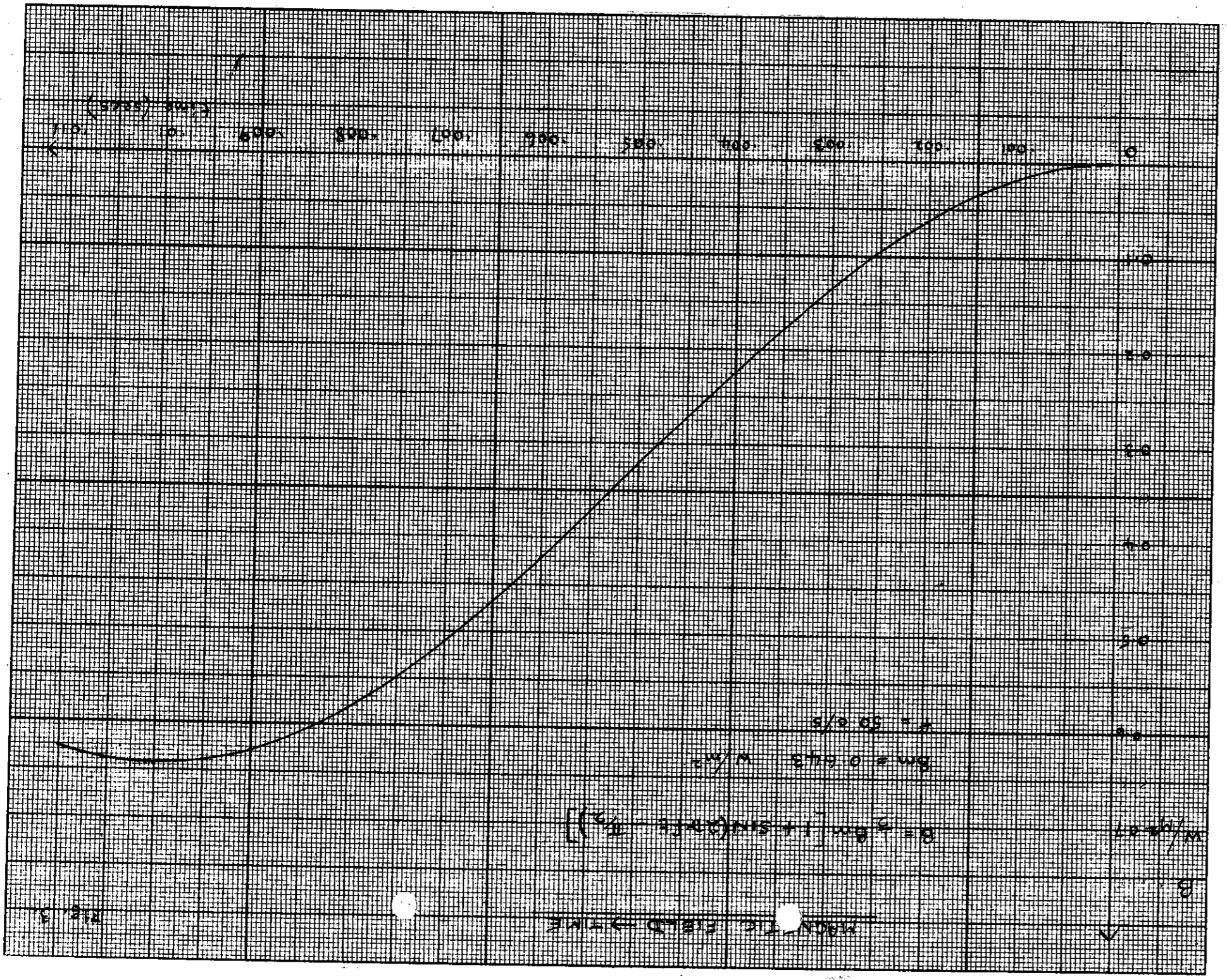
Current relations in NINA:

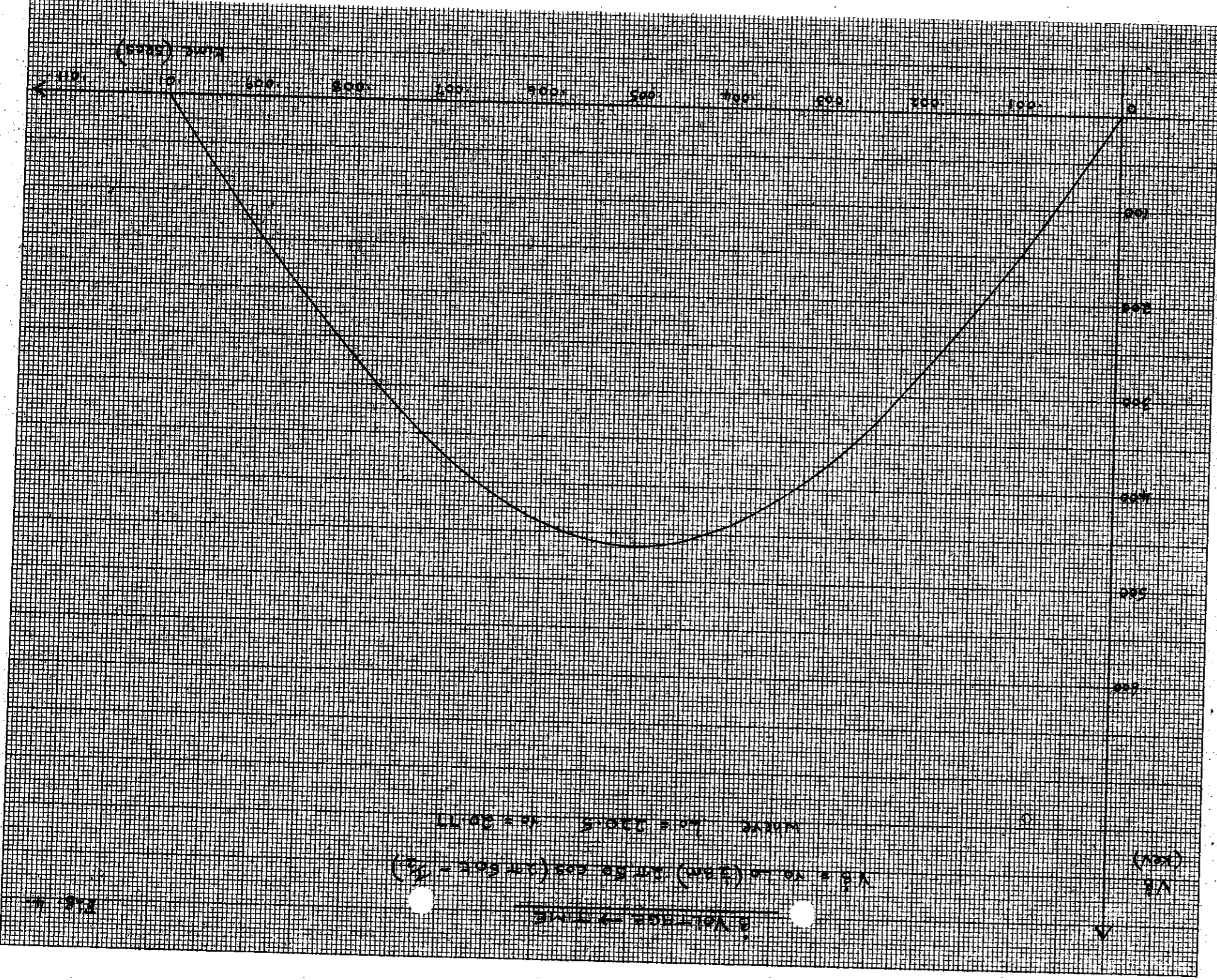
5 x 10¹¹ electrons/pulse \approx 4 μ A mean \equiv 109 mA circulating.
 12.5 x 10¹¹ " " " \approx 10 μ A mean \equiv 272 mA circulating.

b)	NINA		DESY		CEA	
Accelerating cells	15	(?)	48		32	
Peak voltage per cell	163	396	168	410	-	KV
Total cavity shunt-impedance	40		160		120	M Ω
Peak Total R.F. power :			640	286	1500	320
1 μ A						KW
4 μ A	260					KW
10 μ A	480					KW
Mean Total R.F. power:			155	48	150	53
1 μ A						KW
4 μ A	83					KW
10 μ A	150					KW
Peak R.F. power per window			128	18	94	20
1 μ A						KW
10 μ A	96					KW
Mean R.F. power per window			31	3	9.4	3.3
1 μ A						KW
10 μ A	30					KW



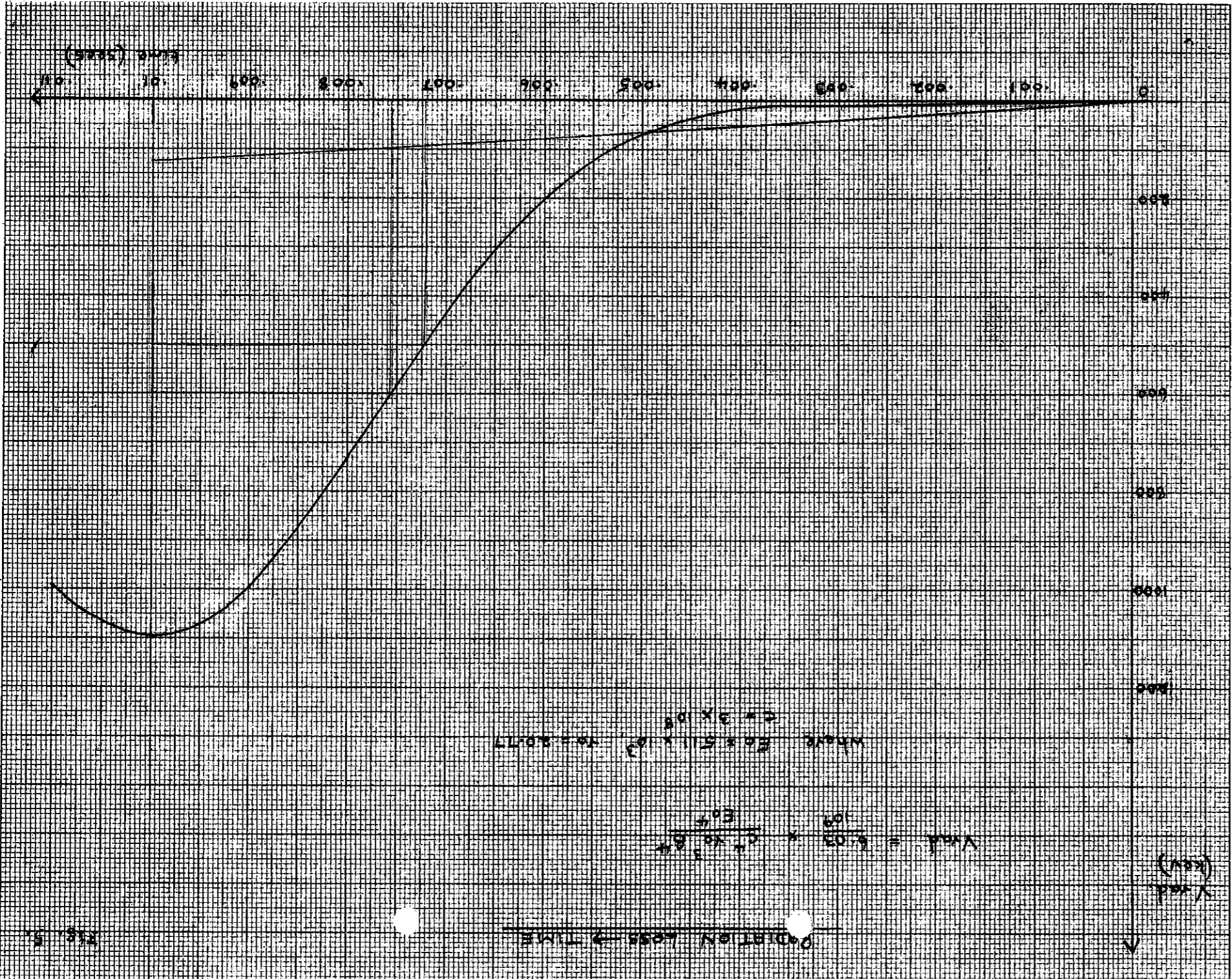


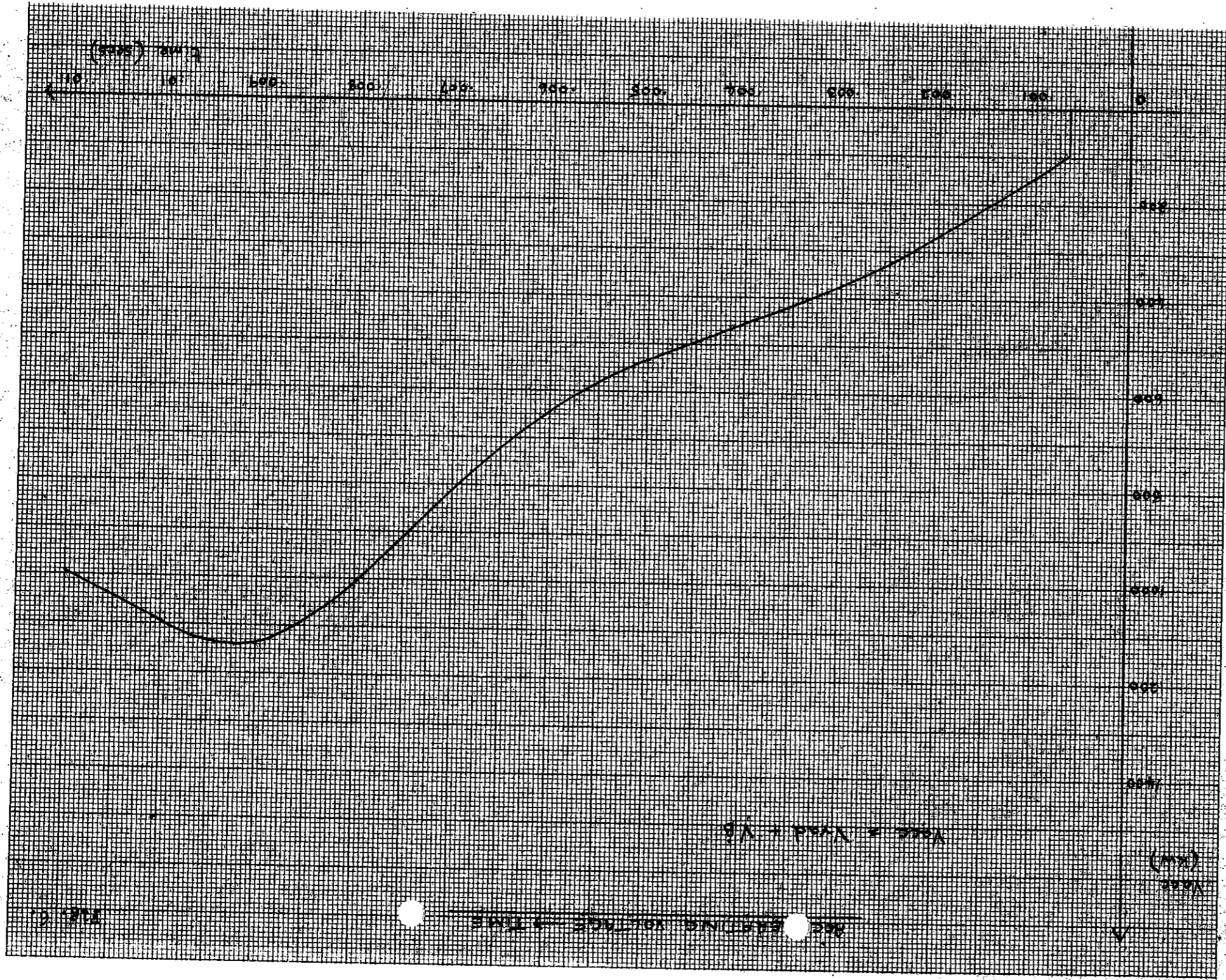


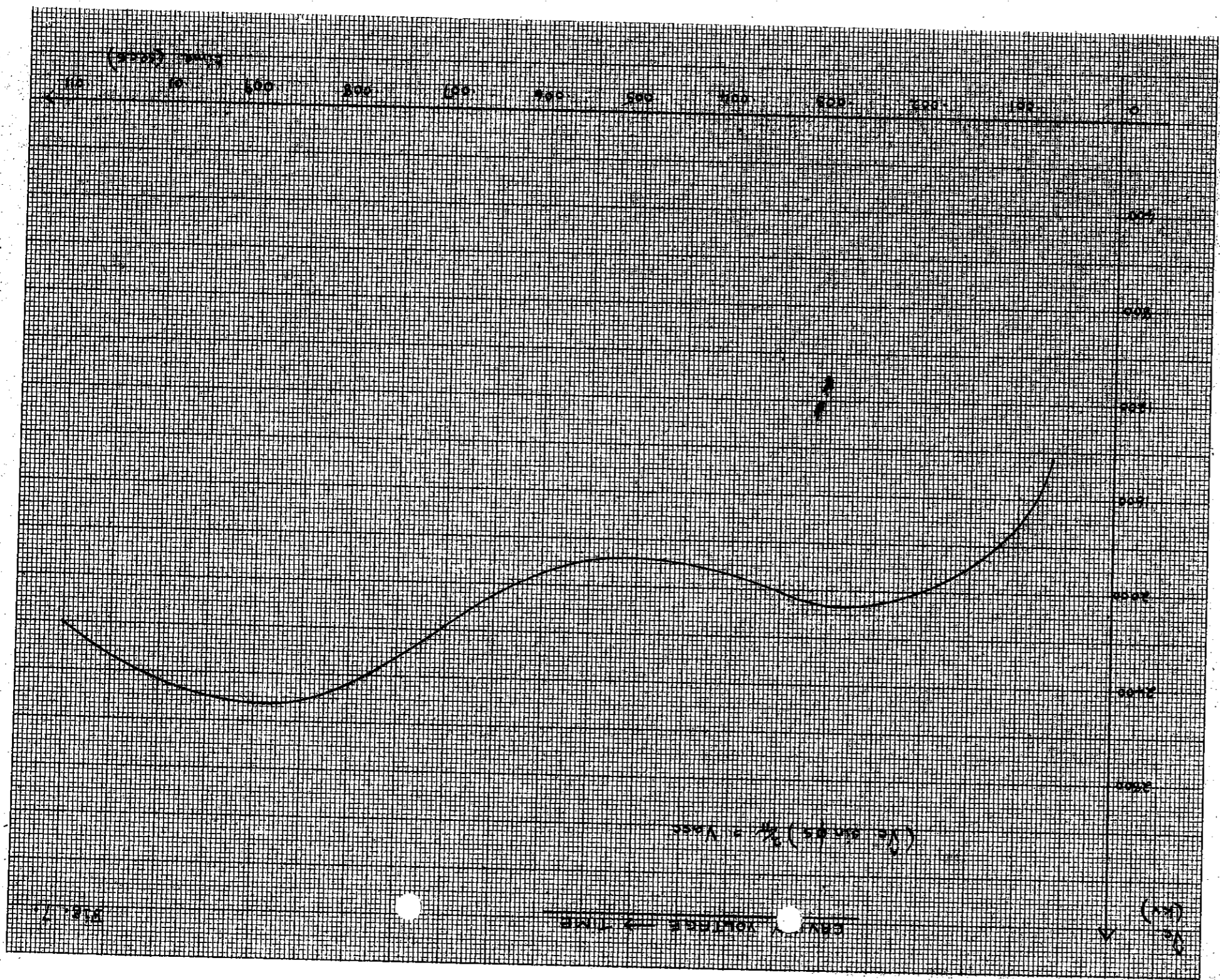


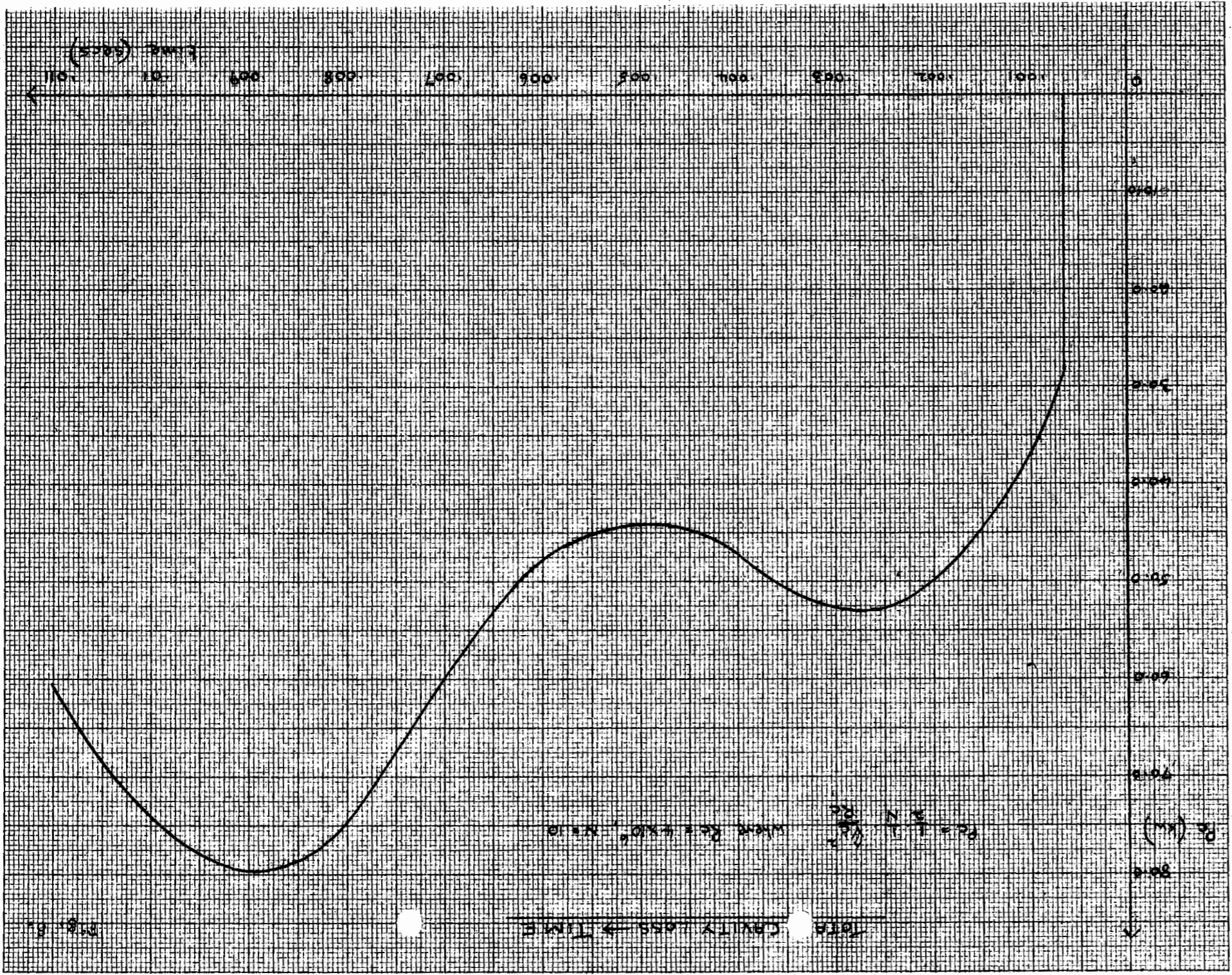
$V_t = 10 - \frac{1}{100} (Rate)^2$
 where V_t is in km/h and $Rate$ is in km/h.

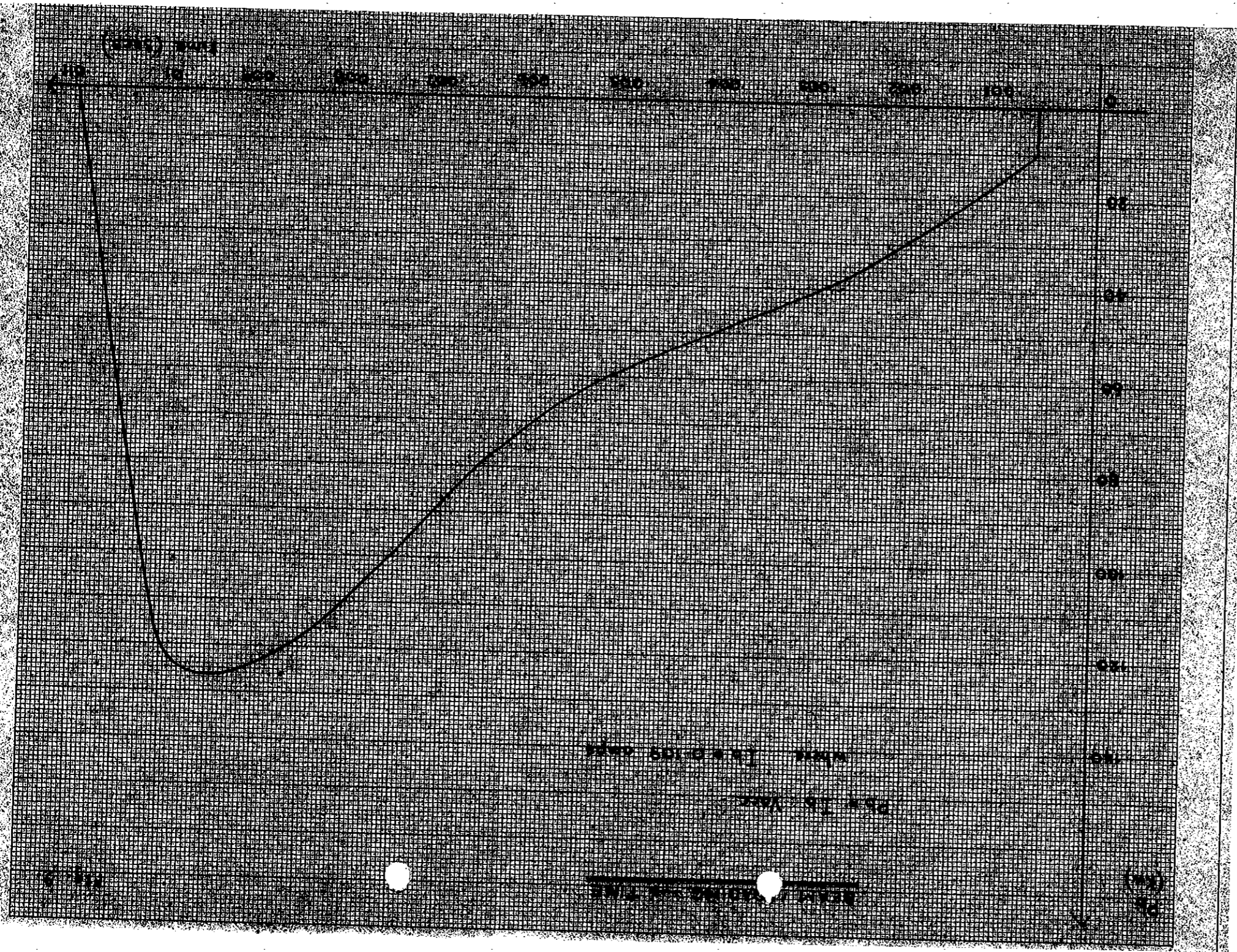
Fig. 4.

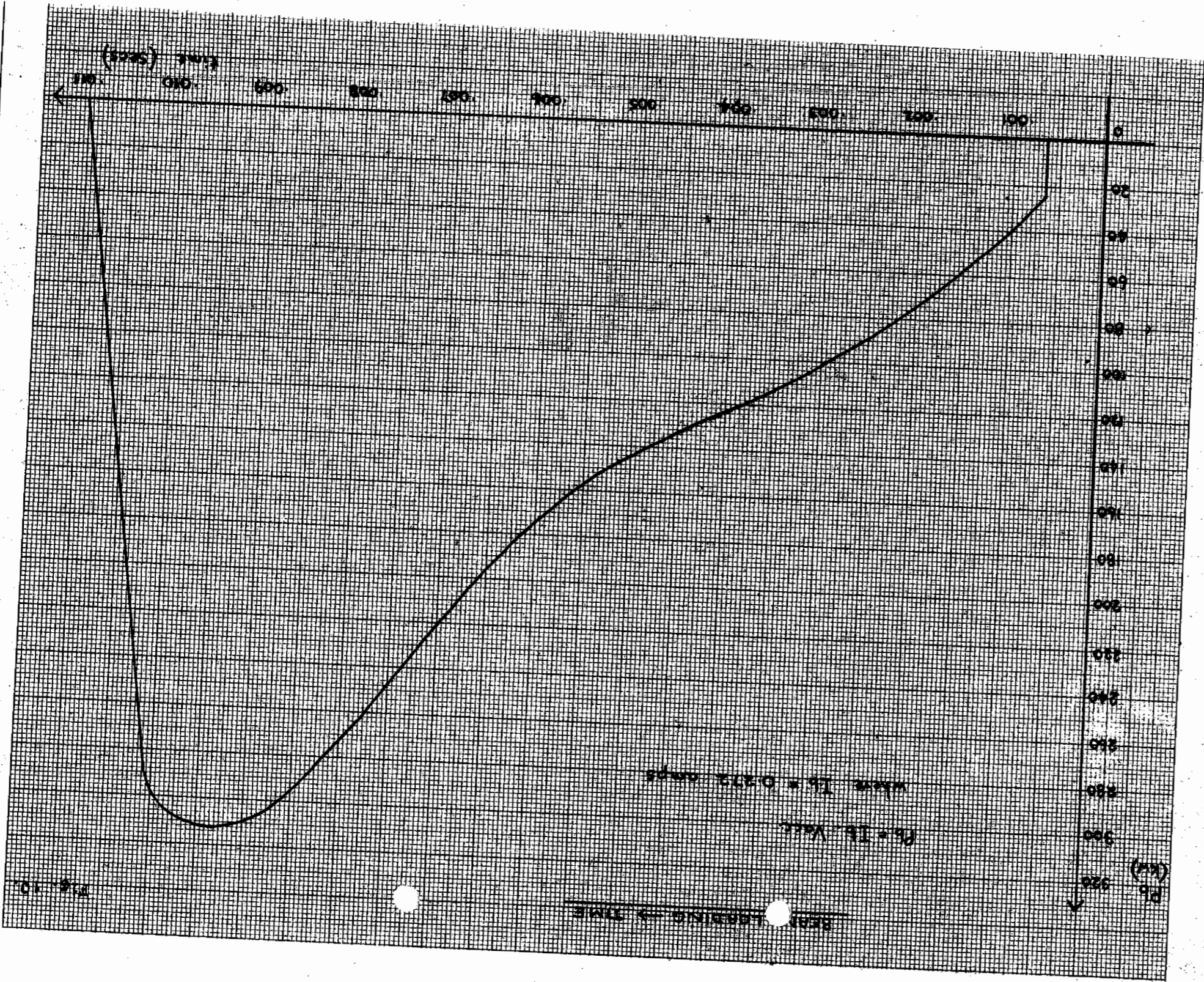


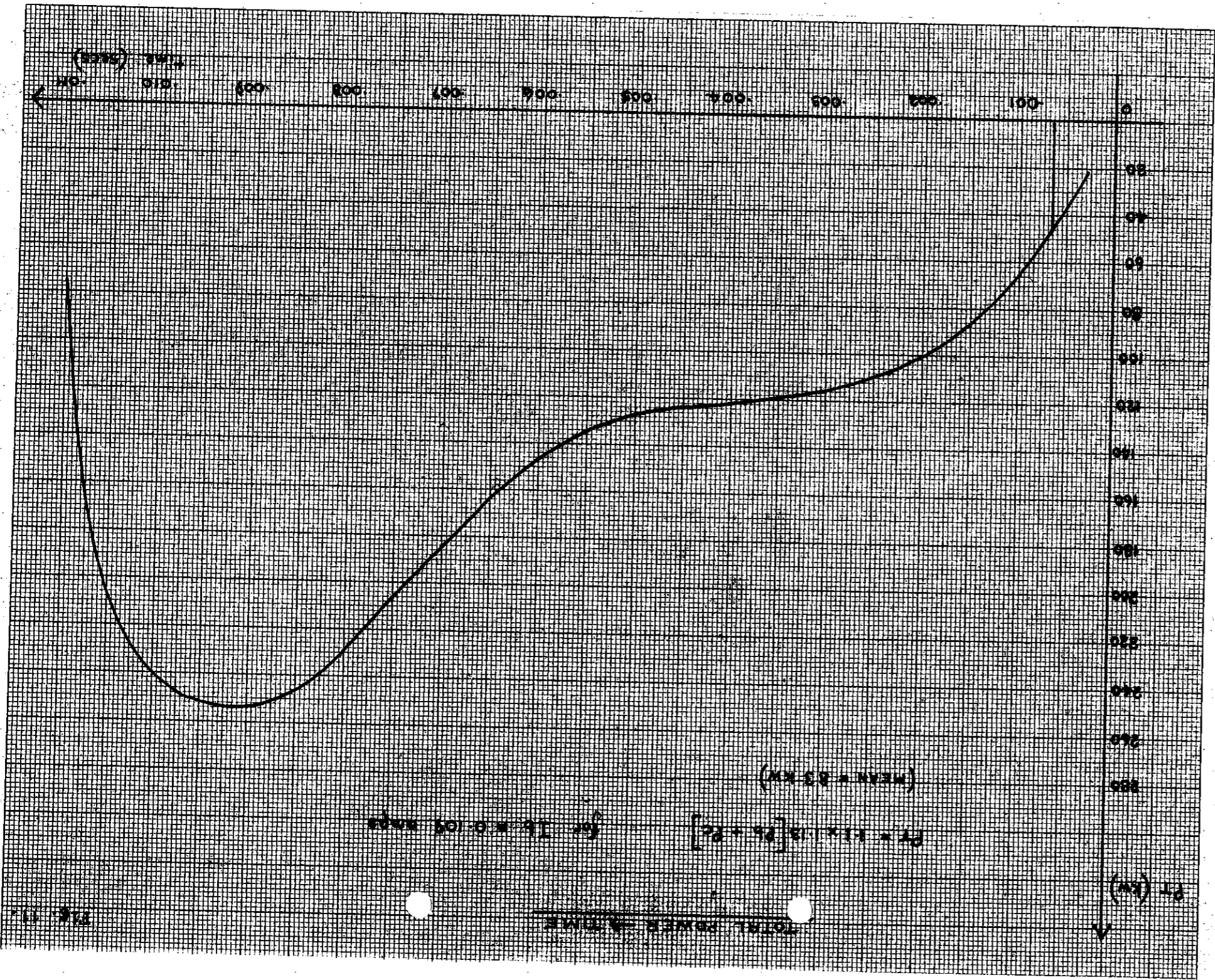


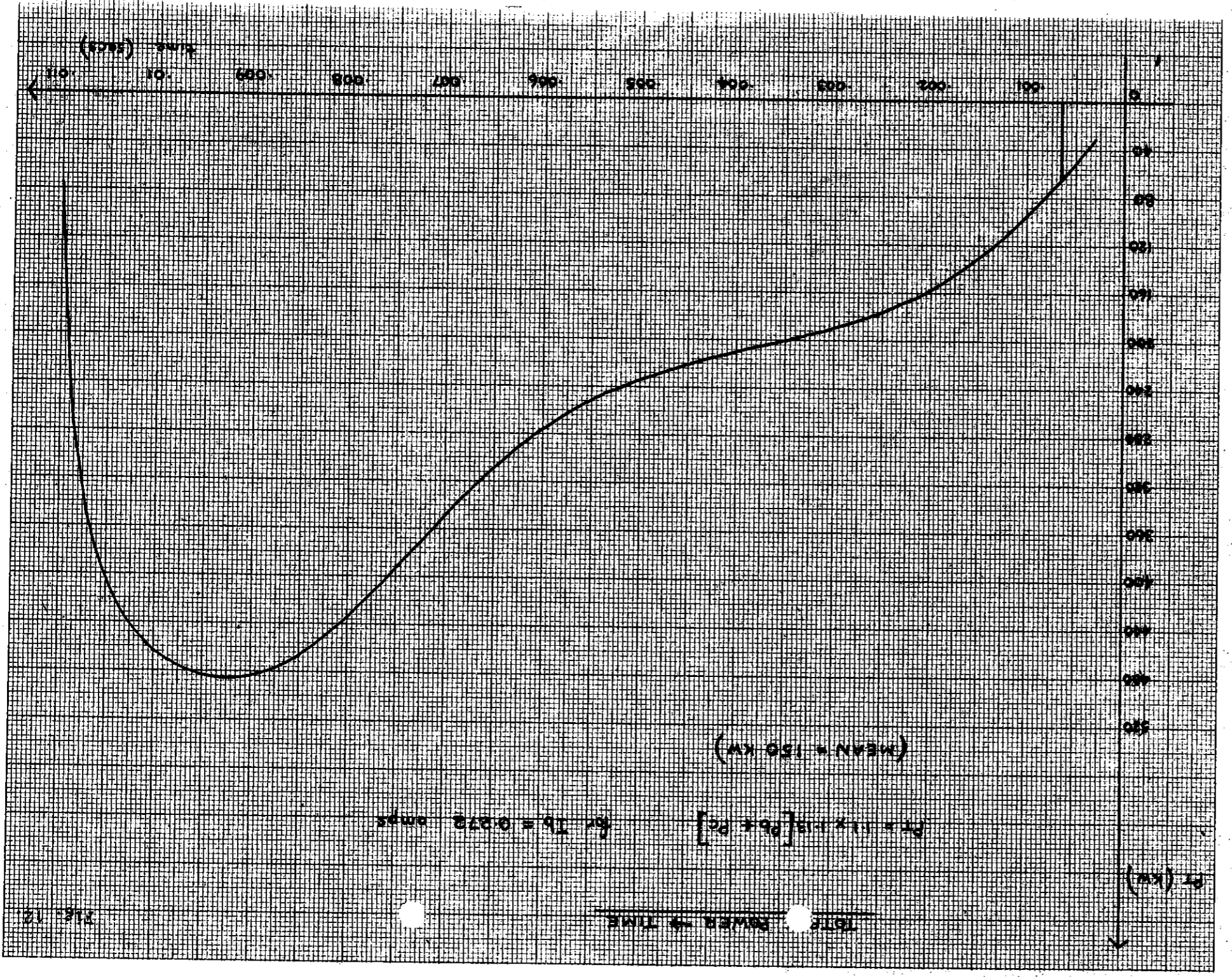


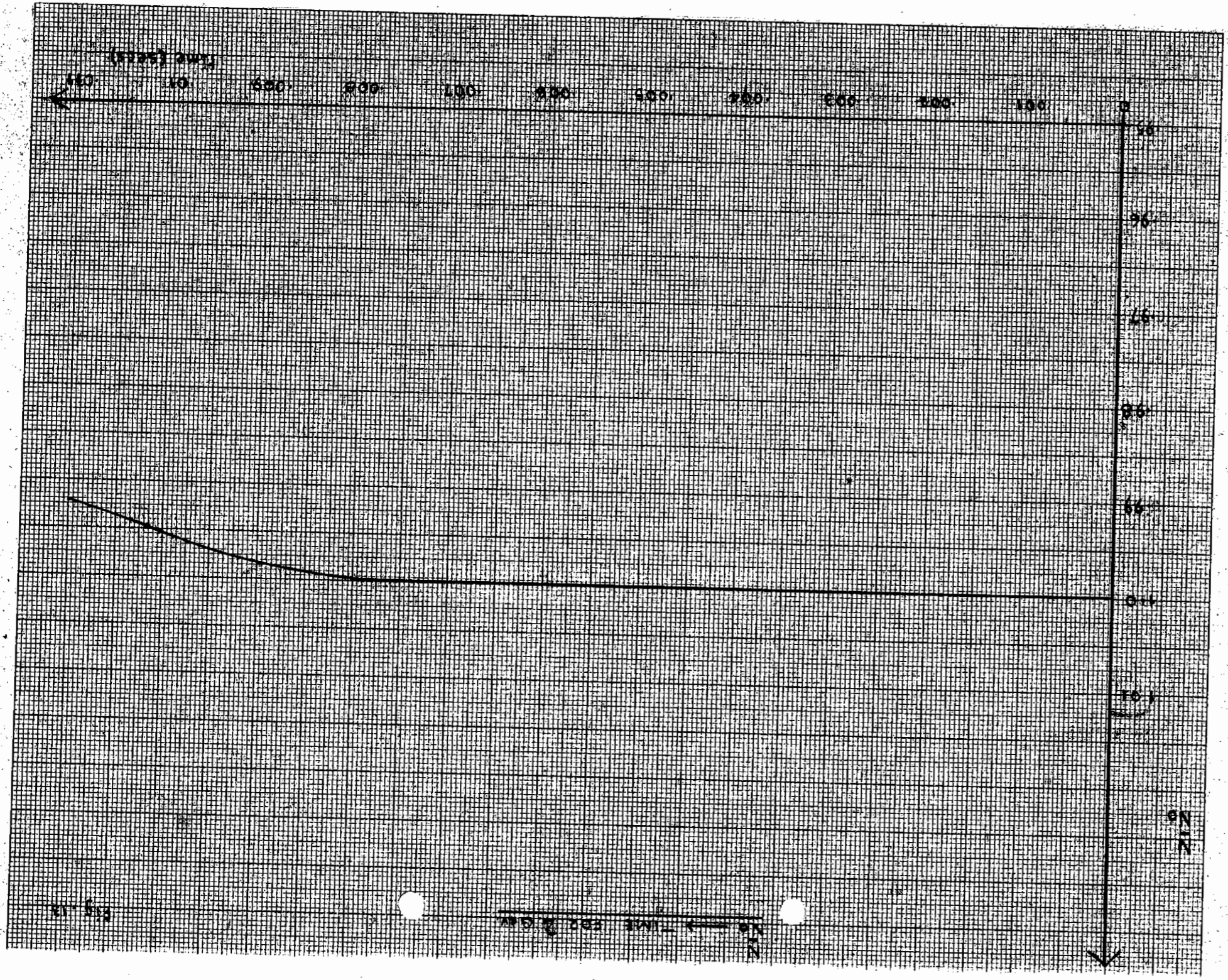


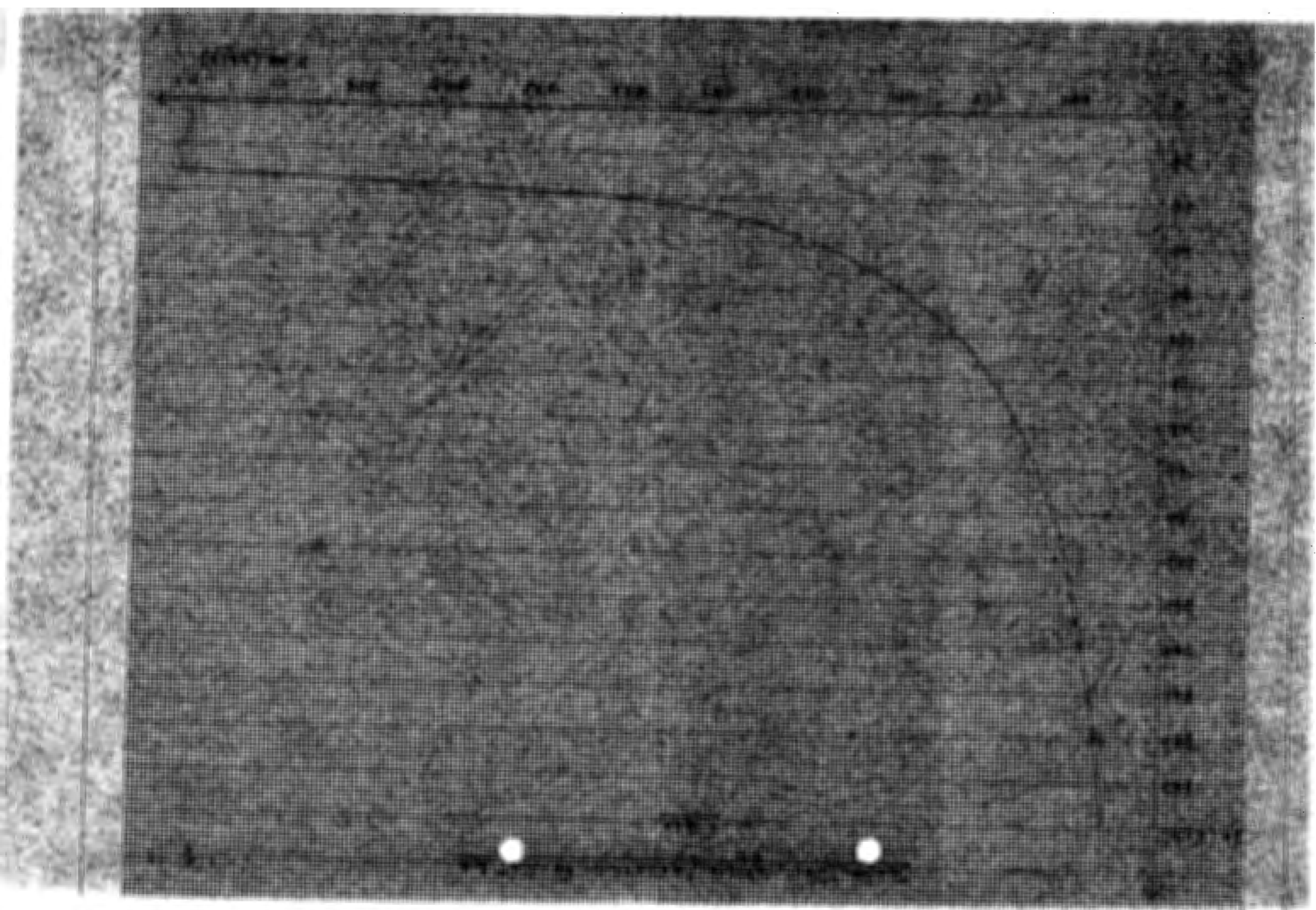


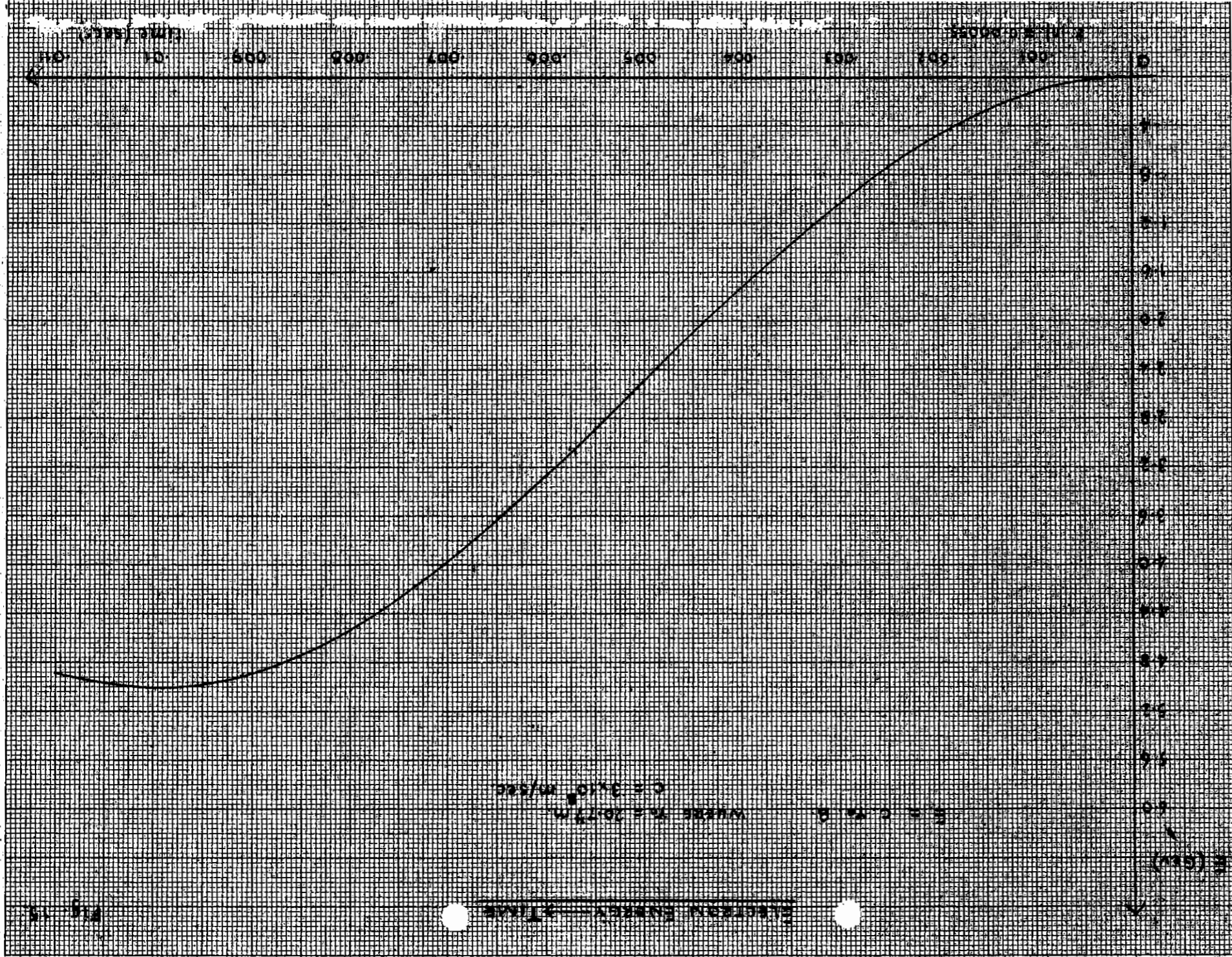


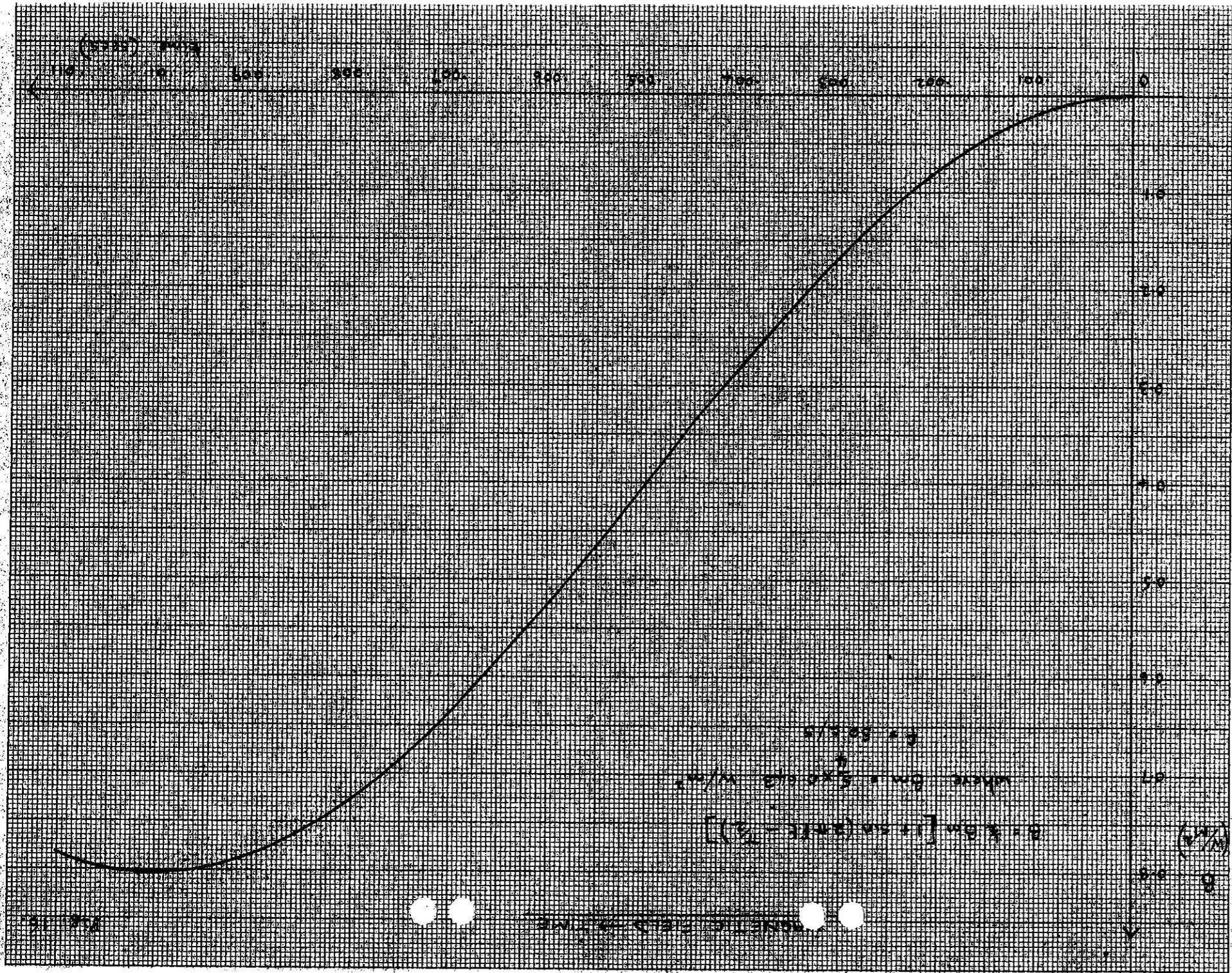












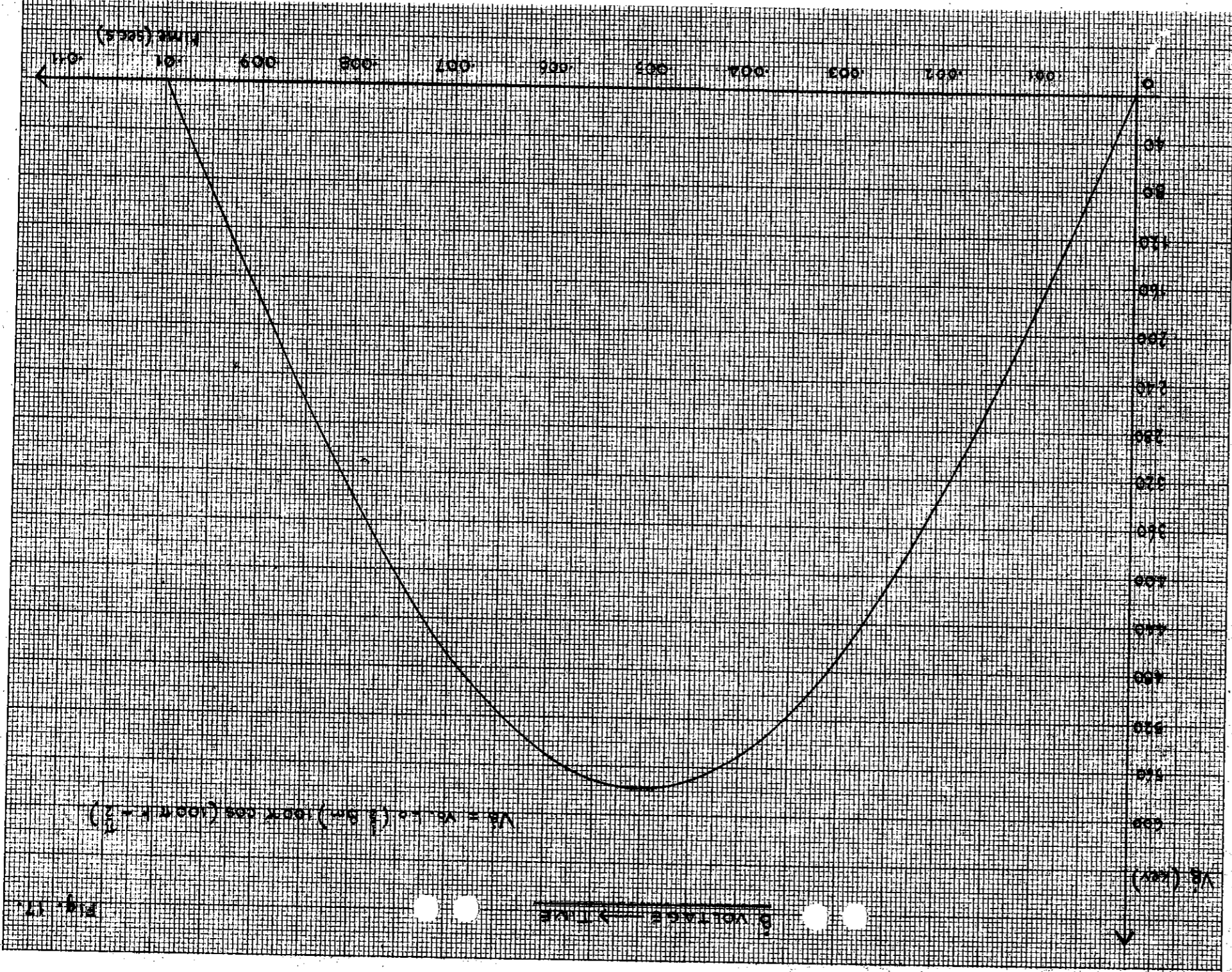
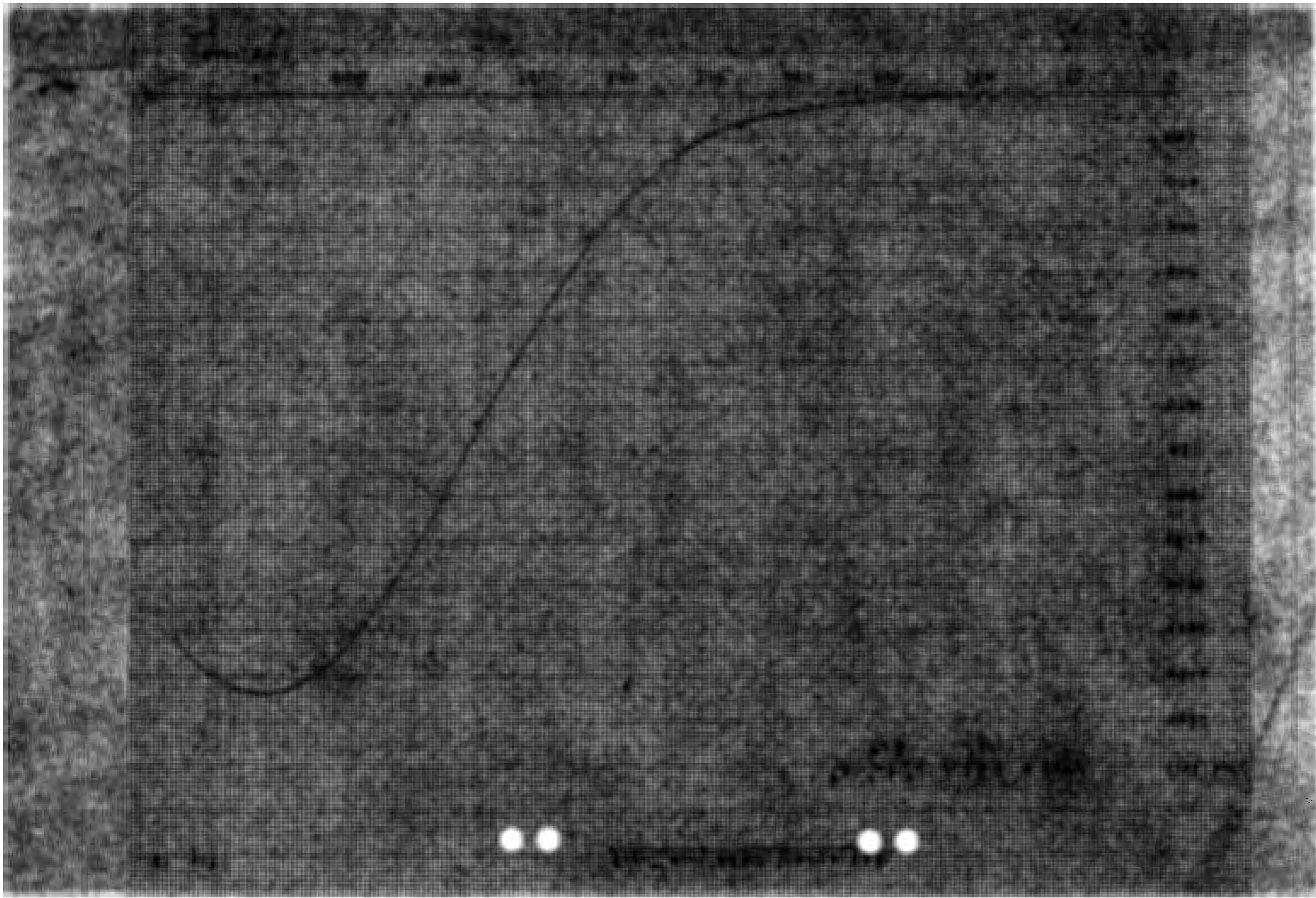
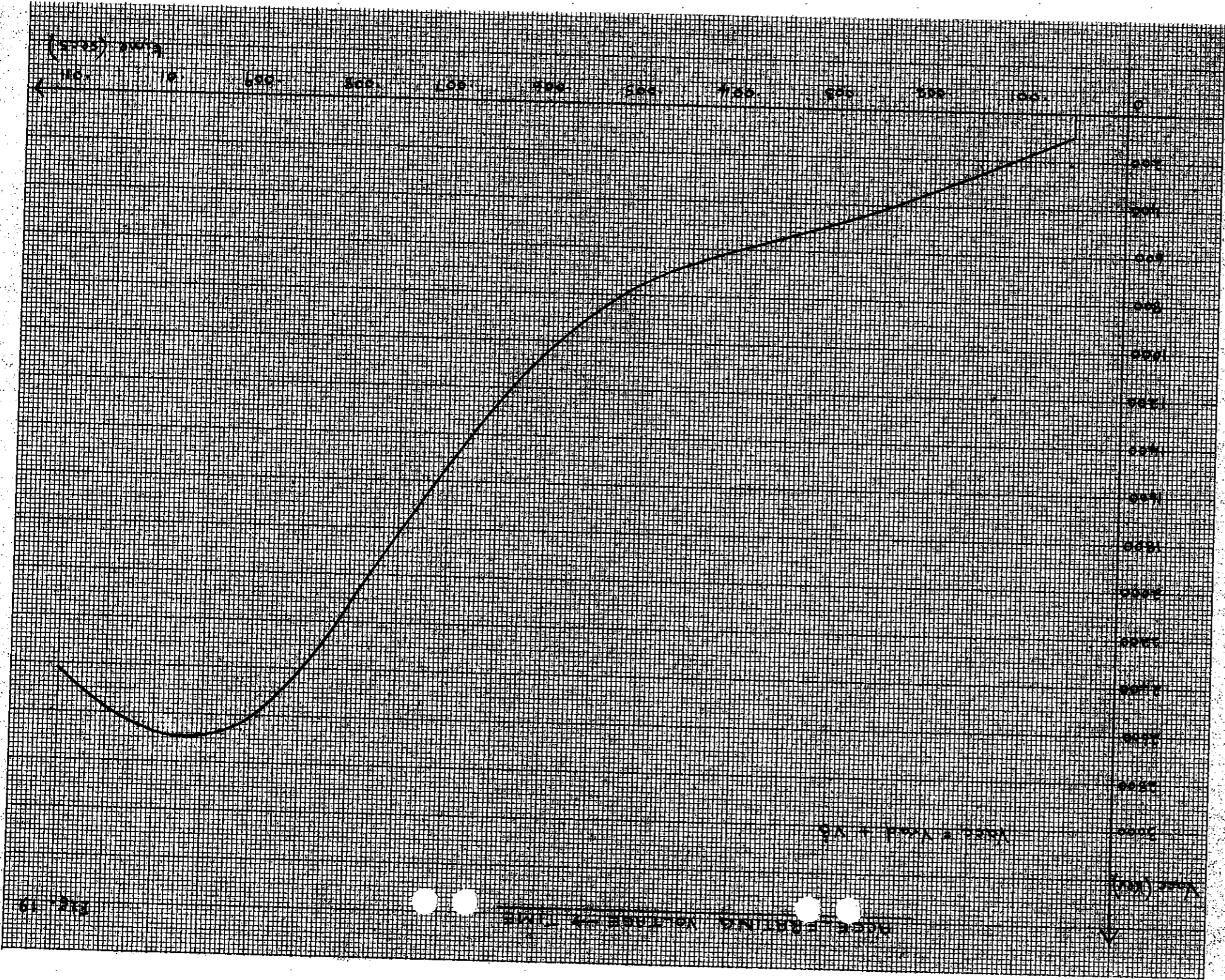
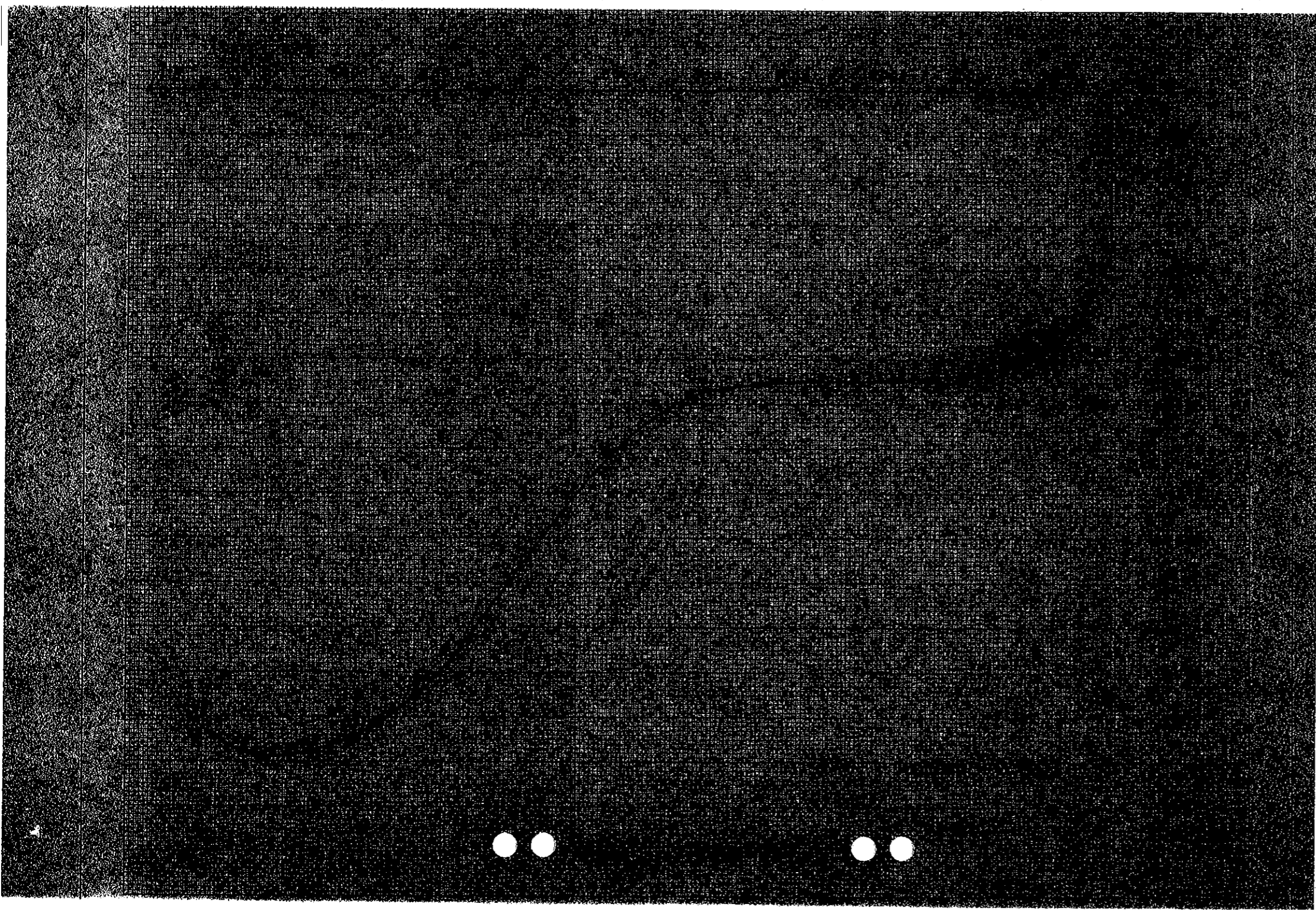
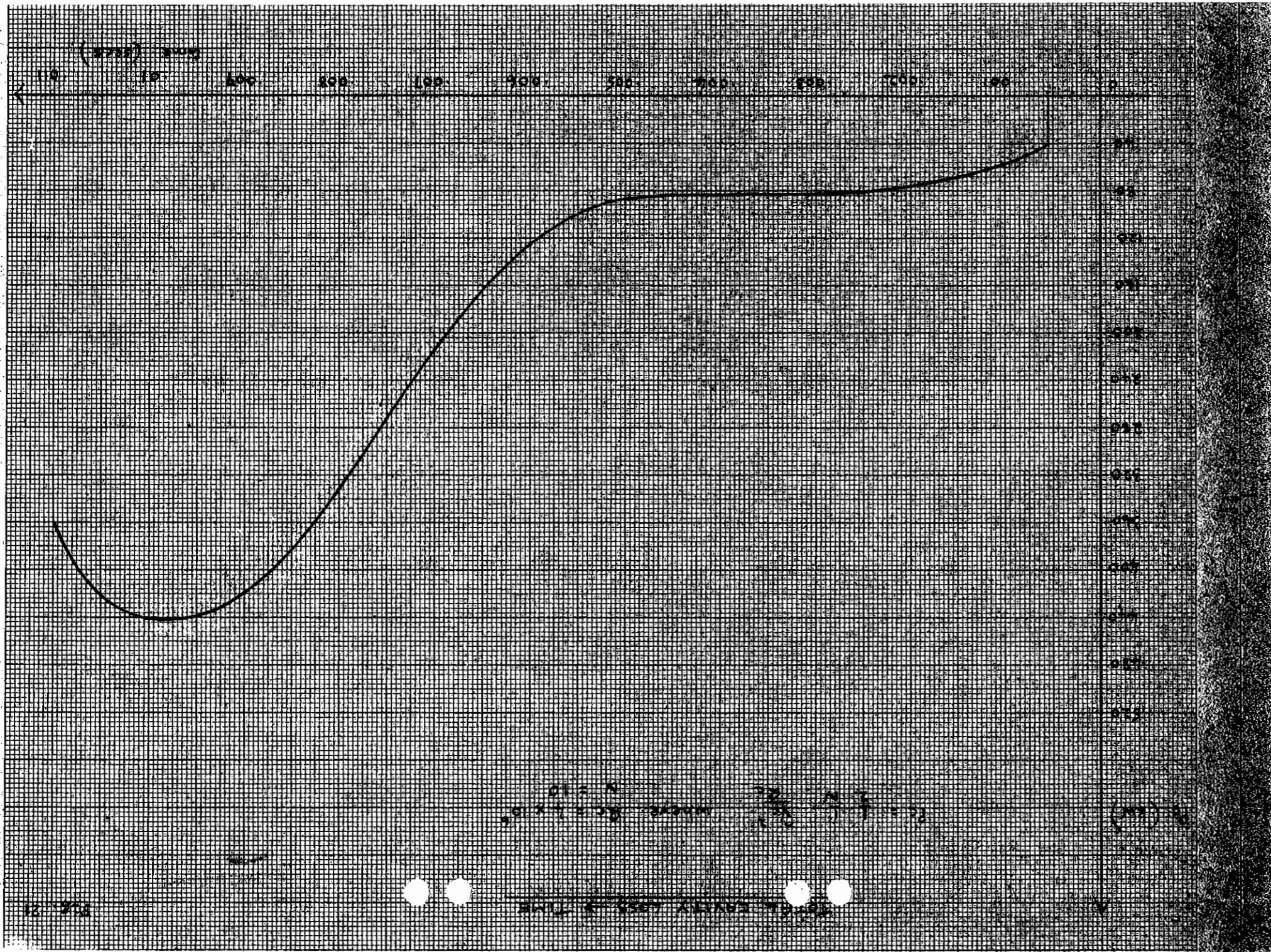


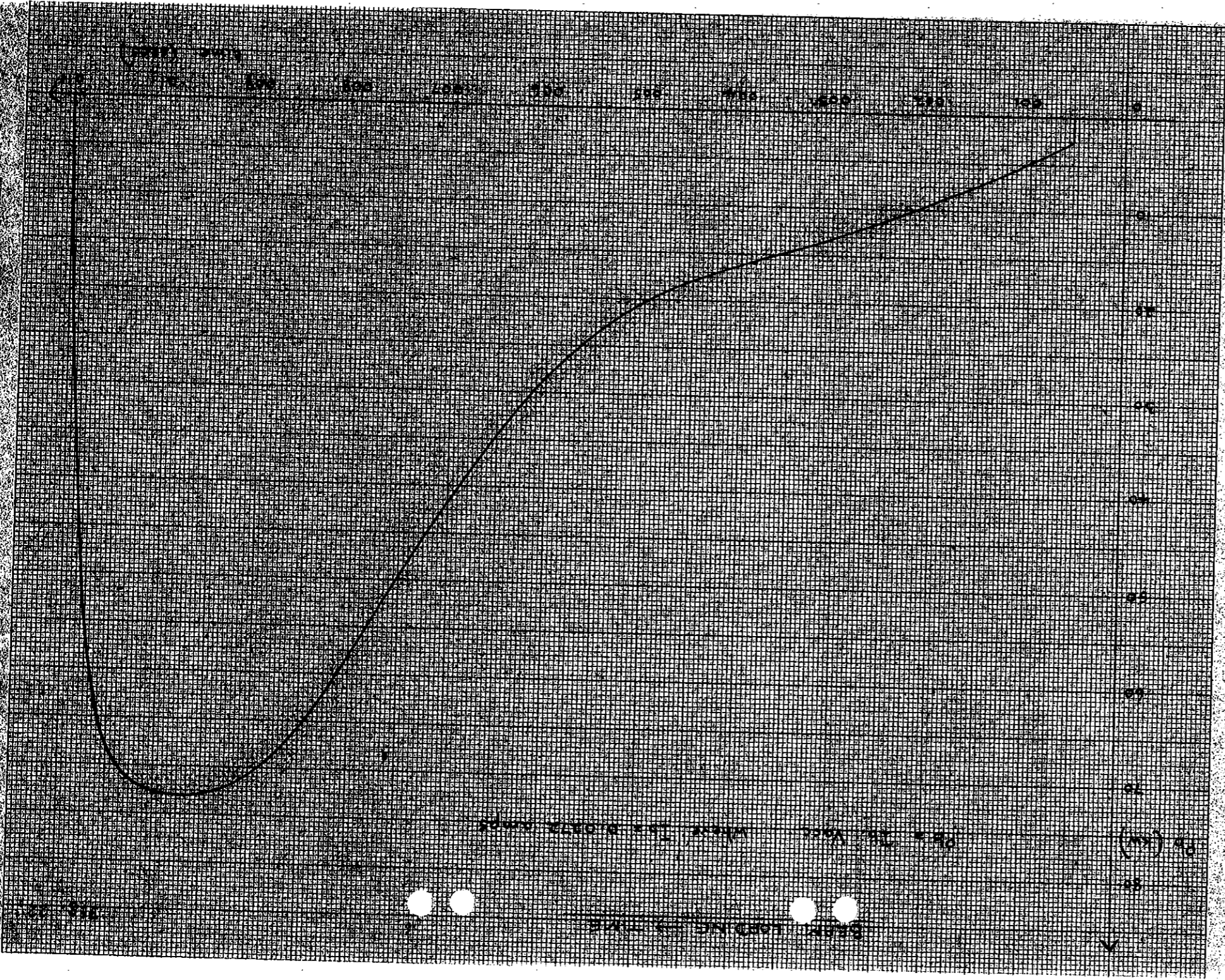
Fig. 17.

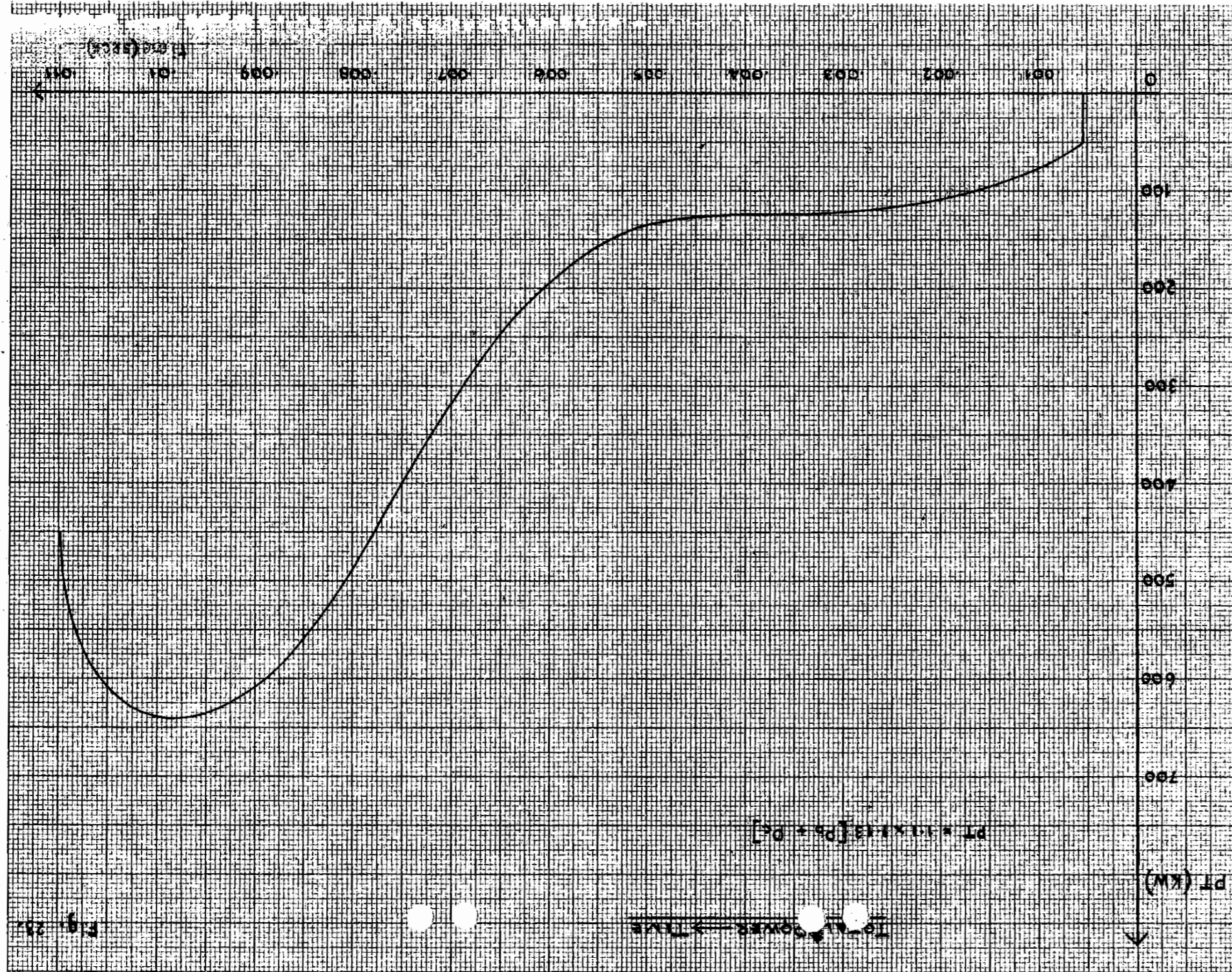












$$PT = I^2 R + P_c$$

Total Power = $I^2 R + P_c$

Fig. 23

