CHAPTER - V

RESULT, GRAPHS AND CONCLUSIONS

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VARIATION IN QUIESCENT CURRENT WITH TEMPERATURE

The current taken by the LM 35 from a power supply will vary with temperature, and will, of course, be increased if any current has to be driven in to a Load by the output terminal. Observation table 5.1 shows the quiescent current variations with temperature for fig.

Quiescent current Vs temperature for Vs = +5V

Table 5.1

Obs. No	TEMP °C	CURRENT µA
1	0	40
2	5	42
3	10	44
4	15	45.5
5	20	48
6	25	51
7	30	54
8	35	56
9	40	58
10	45	60
11	50	63
13	55	65
14	60	68

Obs. No	TEMP °C	CURRENT μA
15	65	70
16	70	72.5
17	75	75
18	80	77
19	85	79
20	90	81.5
21	95	84
22	100	86
23	105	88
24	110	90.5
25	115	93
26	120	95
27	125	97.5
28	130	100
29	135	102.5
30	140	105
31	145	107
32	150	110

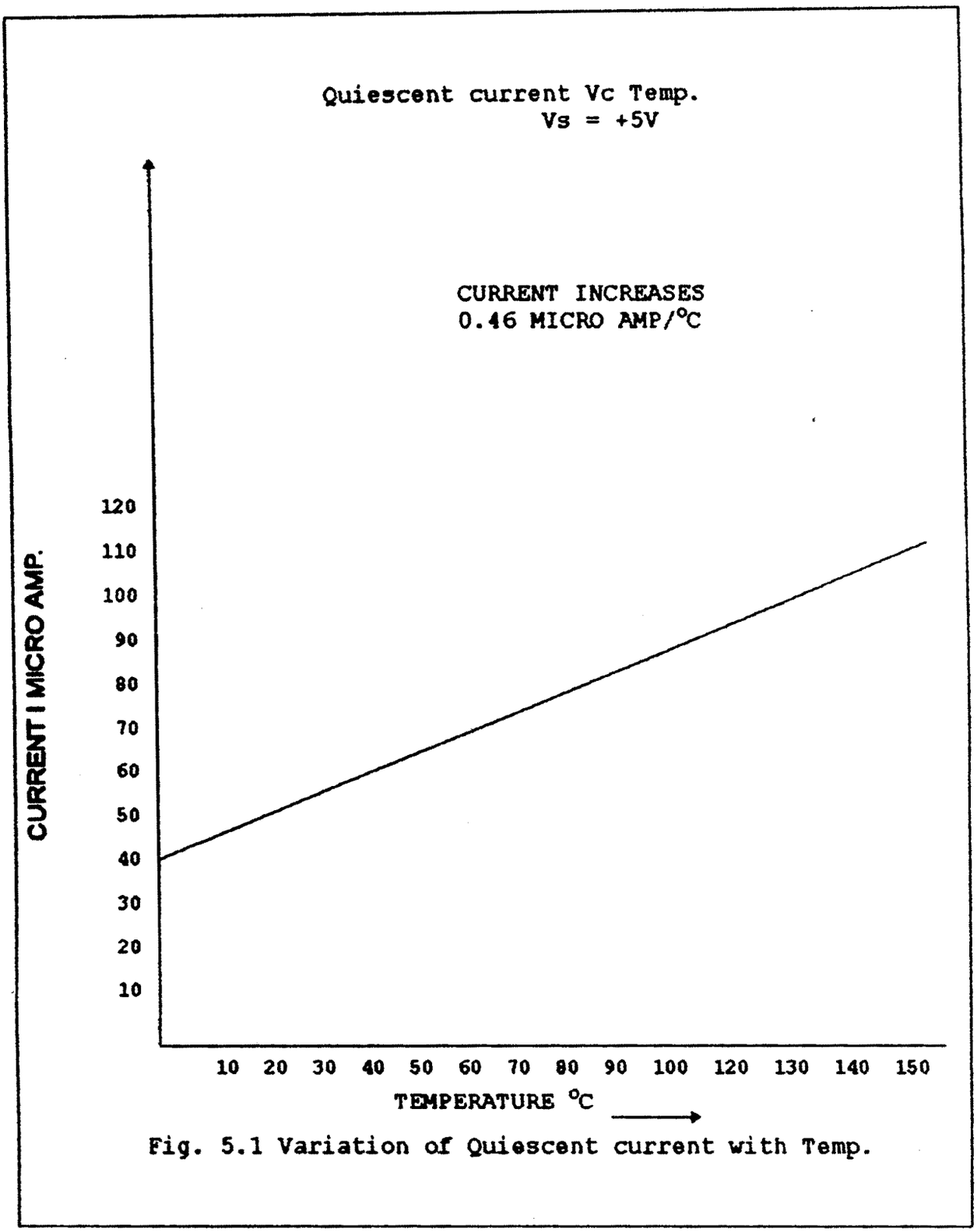

Fig. 5.1 Variation of Quiescent current with Temp.

VARIATION IN OUTPUT VOLTAGE WITH TEMPERATURE

Variation in output voltage of LM35 with temperature for fig. is listed in table 5.2 for supply voltage Vs = +10V

Table 5.2

Ob. No.	TEMP °C	OUTPUT VOLTAGE mV
1	0	1
2	5	50
3	10	99.8
4	15	150
5	20	200
6	25	251
7	30	300
8	35	349
9	40	401
10	45	449.5
11	50	500
12	55	551
13	60	599.9
14	65	650
15	70	702
16	75	751
17	80	801

Ob. No.	TEMP °C	OUTPUT VOLTAGE mV
18	85	849.5
19	90	900.5
20	95	949.6
21	100	999.8
22	105	1050
23	110	1099
24	115	1149
25	120	1198
26	125	1248
27	130	1300
28	135	1347
29	140	1396
30	145	1448
31	150	1495

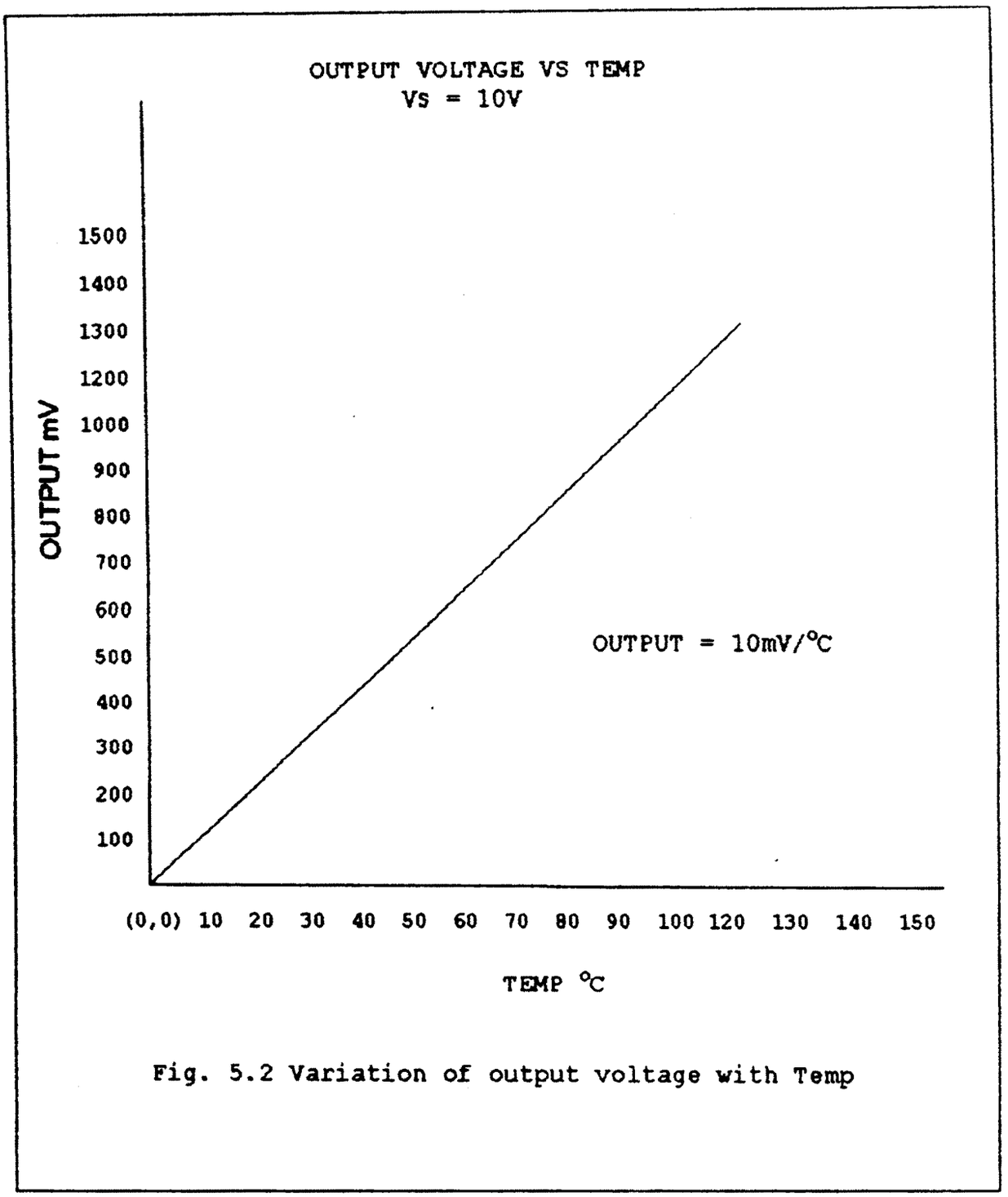

Fig. 5.2 Variation of output voltage with Temp

FREQUENCY VARIATION OF V/F CONVERTER

Variation of output frequency of V/F constructed using LM 331 is given in table 5.3.

Table 5.3 Output frequency of V/F converter

Ob. No	INPUT mV	OUTPUT FREQUENCY Hz
1	10	10
2	100	101
3	200	200
4	300	301
5	400	399
6	500	499
7	600	600
8	700	701
9	800	801
10	900	900
11	1000	998
12	1100	1099
13	1200	1198
14	1300	1300
15	1400	1397
16	1500	1500
17	1600	1599

Ob. No	INPUT mV	OUTPUT FREQUENCY Hz
18	1700	1696
19	1800	1799
20	1900	1895
21	2000	1997
22	2100	2098
23	2200	2195
24	2300	2297
25	2400	2399
26	2500	2495

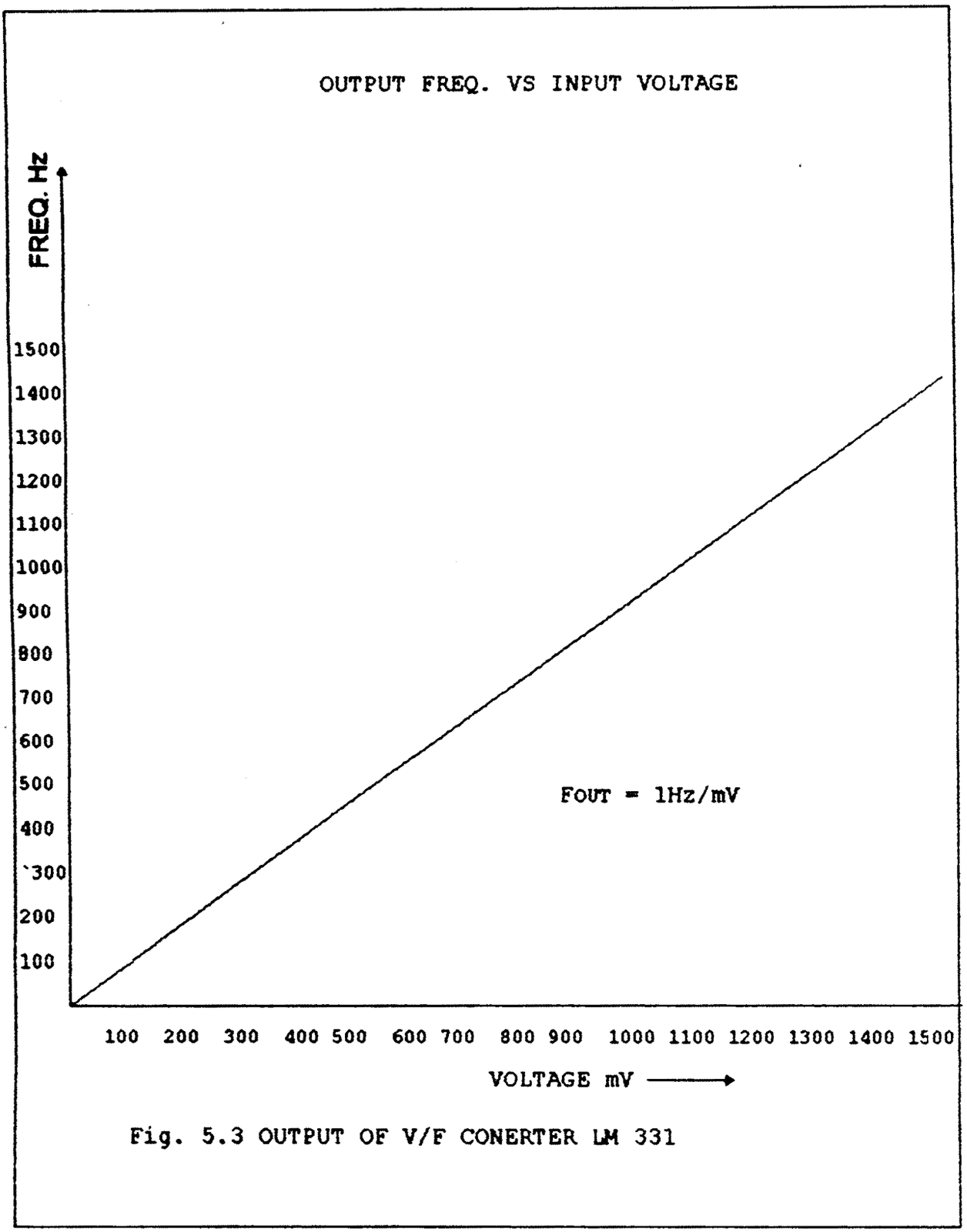

Fig. 5.3 OUTPUT OF V/F CONERTER LM 331

FREQUENCY VARIATION WITH TEMP

Variation of frequency with temperature for circuit constructed using LM 35 and LM 331, is given in Table 5.4.

Table 5.4

Ob. No.	TEMP °C	FREQUENCY Hz
1	10	101
2	20	199
3	30	300
4	40	401
5	50	499
6	60	600
7	70	698
8	80	800
9	90	903
10	100	1002
11	110	1099
12	120	1200
13	130	1302
14	140	1399
15	150	1497

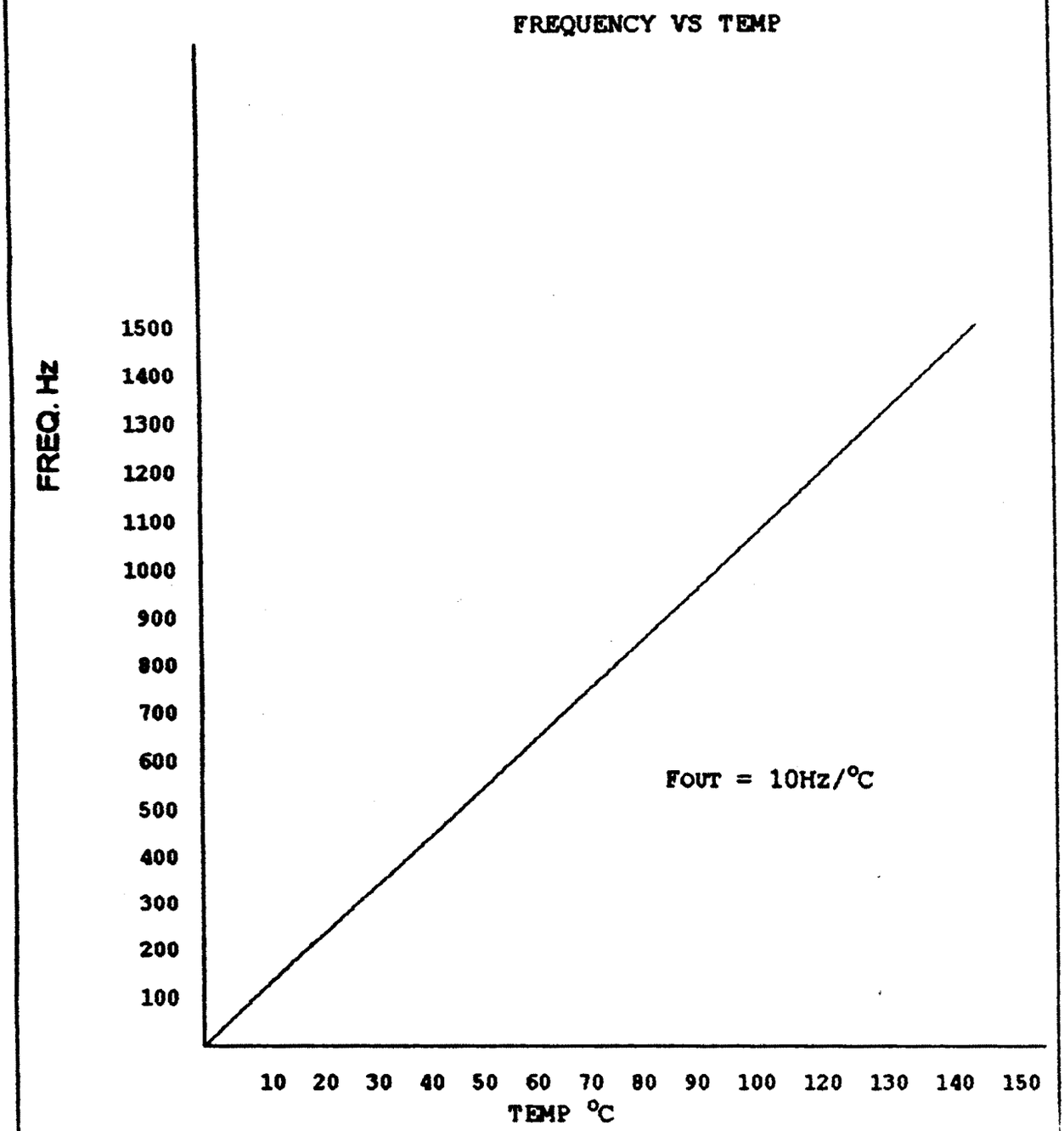

Fig. 5.4 Variation of frequecny with Temp.

RESULT

i) Fig. 5.2 shows the variation of output voltage with temperature. The graph shows that the temperature sensor LM 35 produces output 10mV / °C over temperature range o°C to +150°C.

ii) Fig. 5.3 shows that output frequency varies linearly with input voltage. Output frequency from LM 331 is 10 Hz / 10 mV.

iii) Graph of frequency against Temperature shown in 5.4 indicate that, output frequency varies with 10 Hz / °C.

This frequency is measured by microprocessor and display as a temperature.

SUMMARY

This present work has been proposed out for designing the radio telemetry using microprocessor. With the help of this system attempt has been made to sense, measure and control the temperature. The system is designed to operate over temperature range 0°C to +150 °C.

This dissertation includes five chapters. The first chapter briefly introduces the field of Telemetry. Basic principles of radio telemetry, sampling methods, and modulation techniques. It also includes Time Division Multiplexing and frequency Division Multiplexing. Finally biomedical telemetry is described.

Second chapter deals with problem definition and design consideration of Temperature telemetry. Types of temperature sensors, V/F and F/V converters. FM transmission and reception, type of controller are included in the chapter.

Third chapter includes functional blocks, construction and working of temperature telemetry. It also includes detailed operation of remote system. Interfacing of microprocessor. The fourth chapter gives algorithm, flow chart and developement of microprocessor program. Finally fourth chapter describes execution of the program and setting of temperature.

The last and fifth chapter gives observation, graph and results of the system designed.

CONCLUSIONS

The radio telemetry system, we have designed for measurement and control of temperature, work satisfactory over temperature range 0°C to +150°C. One can increase the temperature range upto 0°C to +1000°C by using Pla tinum RTDS and slight modification in circuit. The system can be used to measure temperature in °K, simply replacing LM 35 by LM 335.

The range of the system is 100m in open area, but range can be increased by adding one r.f. amplifier stage.

The system is basically designed for measurement and control of temperature, but one can use it in number of ways, without changing hardware. We can program the system through software for variety of application. Suppose to increase the temperature is step after specific interval of time. Such applications are very often required in chemical plants and industrial heating.

The system can be used to measure different physical quantities, such as displacement, pressure, intensity of light etc. using suitable sensors.

Finally if any non-linearity results during measurement, the correction can be made through program.