HASMUKH GOSWAMI COLLEGE OF ENGINEERING, VAHELAL

APPLIED MATHEMATICS FOR ELECTRICAL ENGINEERING (3130908)
TUTORIAL 1: CURVE FITTING

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1. A simply supported beam carries a concentrated load P (lb) at its midpoint. Corresponding to various values of P, the maximum deflection Y (in) is measured. The data is given below:

P	100	120	140	160	180	200
Y	0.45	0.55	0.60	0.70	0.80	0.85

Find a law of the form Y=a+bP using the least square method.　　**Ans: Y=0.0476+0.0041P**

2. Fit a second degree polynomial using least square method to the following data:

x	0	1	2	3	4
y	1	1.8	1.3	2.5	6.3

Ans: $y = 1.42-1.07x+0.55x^2$

3. Fit the Exponential curve $y = ae^{bx}$ to the following data:

x	0	2	4	6	8
y	150	63	28	12	5.6

Ans: $y = 146.28\ e^{-0.4117x}$

4. Estimate by fitting the ideal gas law PV =C to the following data:

P	16.6	39.7	78.5	115.5	195.3	546.1
V	50	30	20	15	10	5

Ans: = 1.504

5. Fit a curve $y = ab^x$ to the following data:

x	2	3	4	5	6
y	144	172.8	207.4	248.8	298.5

Ans: $y = (100.0322)(1.1998)^x$

6. Fit a curve $y = ax^b$ to the following data:

x	61	26	7	2.6
y	350	400	500	600

Ans: $y = 702.0644x^{-0.170}$

7. Fit a curve $y = ax+bx^2$ to the following data:

x	-2	-1	0	1	2
y	-72	-46	-12	35	93

Ans: $y = 41.1x + 2.147x^2$

8. Fit a straight line to the following data. Also, estimate the value of y at x=70.

x	71	68	73	69	67	65	66	67
y	69	72	70	70	68	67	68	64

Ans: $y = 0.4242x + 39.5484$　and　$y_{70} = 69.2424$