KFUPM
Mathematical Sciences

Term 042
STAT 212
Quiz# 7

Date: 1/6/2005
Duration: 20 minutes

Name: ID#: Section#: 1 2 3 Serial#:

Show the necessary calculations on the back of the sheet

The table below shows the history of car accidents in the years 1990-1993 according to the size of the vehicle. Use it to answer the following questions;

Year	Quarter	Small Vehicle	% of small vehicles	Trucks
1990	1	28	60	19
	2	20	61	13
	3	30	59	21
	4	21	63	12
1991	1	28	62	17
	2	20	63	12
	3	31	64	17
	4	25	65	13
1992	1	40	59	28
	2	30	58	22
	3	35	57	26
	4	28	60	19
1993	1	42	52	39
	2	31	54	26
	3	43	56	34
	4	30	58	22

Using trend-based forecasting method, answer questions (1-3):

1. The slope of the trend line of the small vehicles series is

a. 0.51 b. 0.61 c. 0.71 d. 0.81 e. 0.91

2. The forecasted value for the 3rd quarter of 1994 is

a. 47.64 b. 41.64 c. 43.64 d. 39.64 e. 45.64

3. The percentage of variation in the # of small vehicles explained by the variation in time is

a. 6.8% b. 16.8% c. 36.8% d. 56.8% e. 66.8%

4. The simple index of the 2nd quarter of 1990 based on that of 1993 is → for the trucks

a. 40% b. 50% c. 60% d. 70% e. 80%

5. The un-weighted index for the 1st quarter of 1992 based on that of 1991 is

a. 150% b. 160% c. 170% d. 180% e. 190%

6. The Laspyre's index for 1992 based on 1990 is → of the 4th quarter

a. 141% b. 131% c. 121% d. 111% e. 101%

With My Best Wishes

(1) Using t as independant (Quarter) and Small vehicle as dependent ⇒ Small vehicle = 22.425 + 0.906 Quarter

Slope = **0.906**

(2) 3rd quarter of 1993 ⇒ t = 19 = 16 + 3 ⇒

Small vehicle = 22.425 + (0.906) 19 = **39.64**

(3) $R^2 = r^2 = (0.6066)^2 = 0.368 \cong$ **36.8%**

(4) $I = \frac{T_{t=3}}{T_{t=15}} \times 100 = \frac{13}{26} \times 100 =$ **50%**

(5) Unweighted $= \frac{(T_9 + S_9)}{(T_5 + S_5)} \times 100 = \frac{(40+28)}{(28+17)} \times 100 = 151.11\%$

$\approx$ **150%**

(6) Laspyr's $= \frac{\sum P_{q_2} q_{90}}{\sum P_{q_1} q_{90}} \times 100 = \frac{28(0.63) + 19(0.37)}{21(0.63) + 12(0.37)} \times 100$

$= 139.61\% \approx$ **141%**