



EASTERN UNIVERSITY, SRI LANKA
THIRD EXAMINATION IN SCIENCE - 2007/2008
SECOND SEMESTER (December/January, 2008/2009)
MT 308 - STTISTICS
(SPECIAL REPEAT)

Answer all Questions

Time: Two hours

- Q1. (a) Show that the mean deviation from the mean and the standard deviation of the arithmetic progression, $a, a + d, \dots, a + 2nd$, are

$$\frac{nd(n+1)}{2n+1} \quad \text{and} \quad d\sqrt{\frac{n(n+1)}{3}},$$

respectively. Verify that the latter is greater than the former.

- (b) Two cricketers scored the following runs in the several innings.

A	42	17	83	59	72	76	64	45	40	32
B	28	70	31	0	59	108	82	14	3	95

- (i) Find who is a better run-getter?
(ii) Who is the more consistent batsman?

- Q2. (a) Derive the equation that is used to calculate the *Spearman's* rank correlation coefficient.

- (e) Compute the coefficient of determination.
- (f) Construct 95% confidence interval for the slope and intercept.
- (g) What is the estimated value of the colour if the temperature is 470.

Q4. You are given the following incomplete frequency distribution. It is known that the total frequency is 1000 and that the median is 413.11. Estimate by calculation the missing frequencies f_1, f_2 .

Profits(Rs. lakhs)	f	Profits(Rs. lakhs)	f
300-325	5	400-425	326
325-350	17	425-450	f_2
350-375	80	450-475	88
375-400	f_1	475-500	9

- (a) Determine the 'modal value' of the above distribution graphically and verify the result by actual calculation.
- (b) Calculate the mean and standard deviation of the above data.
- (c) Calculate the coefficient of skewness from the above data and interpret the result.

- (b) Ten competitors in a beauty contest are ranked by three judges in the following order:

1 st Judge	1	5	4	8	9	6	10	7	3	2
2 nd Judge	4	8	7	6	5	9	10	3	2	1
3 rd Judge	6	7	8	1	5	10	9	2	3	4

Use the rank correlation coefficient to discuss which pair of judges have near approach to common testes in beauty.

- Q3. The effect of the temperature of the deodorizing process on the colour of the finished product was determined experimentally. The data collected were as follows:

Temperature(X)	Colour(Y)
460	0.3
450	0.3
440	0.4
430	0.4
420	0.6
410	0.5
450	0.5
440	0.6
430	0.6
420	0.6
410	0.7
400	0.6
420	0.6
410	0.6
400	0.6

- (a) Construct a scatter diagram for these data. Does the scatter diagram show linear relationship between temperature and colour?
- (b) Fit the estimated regression line.
- (c) Give a brief interpretation of the estimated slope.
- (d) Test at 5% significance level if the slope is different from zero.