



EB 3125 STATISTICS – TEST

Instruction: Answer All Questions.

- a. An obstetrician read that a new born baby loses on average 7 ounces in the first two days of his or her life. He feels that in the hospital where he works, the average weight loss of a new born baby is less than 7 ounces. A random sample of 32 new born babies has a mean weight loss of 6.5 ounces. The population standard deviation is 1.8 ounces. Is there enough evidence at $\alpha = 0.01$ to support the claim? (7 MARKS)
- b. The annual maintenance cost and age of a group of 6 machines of a particular type were recorded and are shown in the following table:

Age (years)	Maintenance cost (RM)
3	308
1	312
5	654
4	428
6	827
4	405

- i. Find the equation of the regression line. (7 MARKS)
- ii. Using the equation of the regression line, predict the maintenance cost when the age of machine is 10 years. (2 MARKS)
- iii. Compute the value of the correlation coefficient and comment on the relationship between variables. (4 MARKS)

FORMULAE

EQUATION OF THE REGRESSION LINE	CORRELATION COEFFICIENT
$y' = a + bx$ $a = \frac{(\sum y)(\sum x^2) - (\sum x)(\sum xy)}{n(\sum x^2) - (\sum x)^2}$ $b = \frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2}$	$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n(\sum x^2) - (\sum x)^2][n(\sum y^2) - (\sum y)^2]}}$