



**EASTERN UNIVERSITY, SRI LANKA**  
**DEPARTMENT OF MATHEMATICS**  
**FIRST EXAMINATION IN SCIENCE - 2007/2008**  
**SECOND SEMESTER (August/September, 2009)**  
**CC 106 - BIostatISTICS**  
**(PROPER & REPEAT)**

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Answer all Questions

Time: One hour

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- Q1. (a) The masses of articles produced in a particular workshop are normally distributed with mean  $\mu$  and standard deviation  $\sigma$ . 5% of the articles have a mass greater than 85g and 10% have a mass less than 25g. Find the values of  $\mu$  and  $\sigma$ , and find the range symmetrical about the mean, within which 75% of the masses lie.
- (b) The lengths of rods produced in a workshop follow a normal distribution with mean  $\mu$  and variance 4. 10% of the rods are less than 17.4 cm long. Find the probability that a rod chosen at random will be between 18 and 23 cm long.
- Q2. (a) At canon Food Corporation, it took an average of 50 minutes for new workers to learn a food processing job. Recently the company installed a new food processing machine. The supervisor at the company wants to find if the mean time taken by new workers to learn the food processing procedure on this new machine is different from 50 minutes. A sample of 40 workers showed that it took, on average, 47 minutes for them to learn the food processing procedure on the new machine with standard deviation of 7 minutes. Test that the mean

learning time for the food processing procedure on the new machine is different from 50 minutes. What will your conclusion be if  $\alpha = 0.05$ ?

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

1 <sup>st</sup> Judge	1	5	4	8	9	6	10	7	3	2
2 <sup>nd</sup> Judge	4	8	7	6	5	9	10	3	2	1
3 <sup>rd</sup> Judge	6	7	8	1	5	10	9	2	3	4

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