EASTERN UNIVERSITY, SRI LANKA

DEPARTMENT OF MATHEMATICS

FIRST EXAMINATION IN SCIENCE - 2016/2017

FIRST SEMESTER (AUG./SEPT., 2018)

EN 1021 - BASIC STATISTICS

Answer all questions.   Time: One hour.

Calculator and Statistical table will be provided.

1. (a) Some seeds were randomly selected and examined for number of physical dam-
   ages. Data are as follows:

No of damages	0	1	2	3	4
Frequency	5	9	6	4	1

   Find the standard deviation of the number of damages.   [20 marks]

   (b) A researcher wants to find the relationship between two variables X and Y.
   He has collected the following data from 6 units.

X	Y	X^2	Y^2	XY
1	9	1	81	9
2	17	4	289	34
3	20	9	400	60
4	28	16	784	112
5	27	25	729	135
6	36	36	1296	216
sum:21	137	91	3579	566

   i. Find the Pearson's correlation coefficient for the sample and interpret it.

[20 marks]

(P. T. O.)

[**Question 1. continued...**]

    ii. Fit a regression model of the form of $Y = \beta_0 + \beta_1 X$.   [25

    iii. Check the significance of parameters β_0 and β_1 at 5% significance le

        interpret the significant parameter/s.   [30

    iv. Estimate the average of Y when the value of X is 2.5.   [05

2. (a) Suppose that the probability of recovery for a certain disease is 0.

       patients are selected randomly, what is the probability that at least 4

       will recover.   [25

  (b) An agricultural research has concluded that average number of roots of

       crop is 5. Find the probability that a randomly selected plant will ha

       than 2 roots.   [25

  (c) Suppose that the volume(in ml) of a certain pesticide bottles is norm

       tributed with mean of 400 ml and variance of 25 ml. What is the pro

       that the volume of a randomly selected bottle will be between 398 ml

       ml?   [25

  (d) For testing the hypothesis: $H_0 : \mu \geq 25$ vs $H_1 : \mu < 25$, a sample

       normally distributed population has been taken. Test the hypothes

       significance level by using the following summarized data of the samp

       with the usual notations: $n = 10$; $\overline{X} = 22$; $S^2 = 12$.   [25

-THE END-