I. Citizens’ Forum for Poverty Alleviation has fitted a regression equation to estimate the expenditure on food items of rural households in Karnataka. They had used family size defined as the number of members in the family (Size), Expenditure on education for children (Education), and Income (in hundreds of rupees) as the explanatory variables. The EXCEL output is given below:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Regression Statistics |   |   |   |   |   |   |   |
| Multiple R | 0.9962 |   |   |   |   |   |   |   |
| R Square | 0.992414 |   |   |   |   |   |   |   |
| Adjusted R Square |   |   |   |   |   |   |   |   |
| Standard Error | 5.3278 |   |   |   |   |   |   |   |
| Observations | 10 |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |
| ANOVA |   |   |   |   |   |   |   |   |
|   | df | SS | MS | F | Significance F |   |   |   |
| Regression | 3 | 22520.09 | 7506.696 | 264.4561 | 0 |   |   |   |
| Residual | 6 | 170.3125 | 28.3854 |   |   |   |   |   |
| Total | 9 | 22690.4 |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |
|   | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% | Lower 99.0% | Upper 99.0% |
| Intercept | -15.1472 | 10.4034 | -1.45599 | 0.1956 | -40.6034 | 10.30904 | -53.7171 | 23.42263 |
| Size | 1.3961 | 1.23119 | 1.133944 | 0.3001 | -1.61644 | 4.40864 | -3.16848 | 5.96068 |
| Income | 79.323 | 3.074 | 25.80449 | 0 | 71.8015 | 86.8445 | 67.9265 | 90.719 |
| Education | -1.73606 | 1.944076 | -0.893 | 0.4062 | -6.49292 | 3.02076 | -8.94335 | 5.471235 |

Answer following questions based on the output:

1. What proportion of the variation of food expenditure is explained by the regression equation?
2. Interpret the meaning of the coefficient with respect to income (79.323) indicate?
3. What does the P-value 0.3001 (Size) mean?
4. What is the t-value corresponding to the regression coefficient with respect to Income? What is the corresponding p-value? What is the degrees of freedom that you used in calculating this p-value?(3)
5. What is the standard error corresponding to the regression coefficient of Education? (2)