3. (15 marks) An experiment was conducted to model $Y$ with five explanatory variables $X_1$, $X_2$, $X_3$, $X_4$ and $X_5$. We desire an equation of relating $Y$ to the other variables. The goal is to find variables that should be further studied with the eventual goal of developing a prediction equation. The following table gives RSS for all possible regressions. Total sum of squares is equal to 5.0634 and the number of observations is equal to 20.

| No. of parameters in the model | RSS | Model |
|---|---|---|
| 2 | 2.0338 | $X_1$ |
| 2 | 5.0219 | $X_2$ |
| 2 | 1.5370 | $X_3$ |
| 2 | 2.5044 | $X_4$ |
| 2 | 1.5563 | $X_5$ |
| 3 | 1.5921 | $X_1$, $X_2$ |
| 3 | 1.4397 | $X_1$, $X_3$ |
| 3 | 1.7462 | $X_1$, $X_4$ |
| 3 | 1.4963 | $X_1$, $X_5$ |
| 3 | 1.4707 | $X_2$, $X_3$ |
| 3 | 2.4381 | $X_2$, $X_4$ |
| 3 | 1.4388 | $X_2$, $X_5$ |
| 3 | 1.4590 | $X_3$, $X_4$ |
| 3 | 1.0850 | $X_3$, $X_5$ |
| 3 | 1.3287 | $X_4$, $X_5$ |
| 4 | 1.2582 | $X_1$, $X_2$, $X_3$ |
| 4 | 1.4257 | $X_1$, $X_2$, $X_4$ |
| 4 | 1.2764 | $X_1$, $X_2$, $X_5$ |
| 4 | 1.3894 | $X_1$, $X_3$, $X_4$ |
| 4 | 1.0644 | $X_1$, $X_3$, $X_5$ |
| 4 | 1.3204 | $X_1$, $X_4$, $X_5$ |
| 4 | 1.3900 | $X_2$, $X_3$, $X_4$ |
| 4 | 0.9871 | $X_2$, $X_3$, $X_5$ |
| 4 | 1.2178 | $X_2$, $X_4$, $X_5$ |
| 4 | 1.0634 | $X_3$, $X_4$, $X_5$ |
| 5 | 1.2199 | $X_1$, $X_2$, $X_3$, $X_4$ |
| 5 | 0.9871 | $X_1$, $X_2$, $X_3$, $X_5$ |
| 5 | 1.1565 | $X_1$, $X_2$, $X_4$, $X_5$ |
| 5 | 1.0388 | $X_1$, $X_3$, $X_4$, $X_5$ |
| 5 | 0.9653 | $X_2$, $X_3$, $X_4$, $X_5$ |
| 6 | 0.9652 | $X_1$, $X_2$, $X_3$, $X_4$, $X_5$ |

Find the best model by $C_p$, forward selection, backward selection and stepwise selection. Write down how to get the best model on details. Choose critical values for both ENTRY and STAY to be 2. Comment the results.