## Quiz 1

1. (10\%) After the graduation ceremonies at a university, 4 graduates were asked whether they were in favor of (identified by 1) or against (identified by 0 ) death penalty. Some information about these graduates is shown below.

| Student | Age | Class Rank | Issue Opinion |
| :---: | :---: | :---: | :---: |
| Nancy | 19 | 3 | 1 |
| Mary | 22 | 10 | 1 |
| John | 20 | 7 | 0 |
| David | 21 | 25 | 0 |

(a) Write down all observations.
(b) Which of the above variables are qualitative and which are quantitative?
2. (20\%)
(a) $\mathbf{2 4 0}$ students in the School of Business were asked what their majors were. The following represents their responses ( $\mathrm{M}=$ Management; $\mathrm{A}=$ Accounting; E = Economics; O = Others).

| Majors | M | A | E | O |
| :---: | :---: | :---: | :---: | :---: |
| Frequency | 66 | 54 | 72 | 48 |

Please construct a bar plot and a pie plot both using the percent frequency.
(b) Below you are given the examination scores of 20 students. Construct a stem-and-leaf display for the following data.

| 50 | 99 | 92 | 86 | 84 |
| :--- | :--- | :--- | :--- | :--- |
| 63 | 72 | 76 | 95 | 88 |
| 92 | 58 | 65 | 79 | 80 |
| 90 | 74 | 75 | 56 | 99 |

3. (60\%) Please answer the following questions based on a sample of data:

| 1 | 3 | 6 | 2 | 13 |
| :--- | :--- | :--- | :--- | :--- |

(a) The variance,
(b) The coefficient of variation,
(c) The $31^{\text {th }}$ percentile, $62^{\text {th }}$ percentile and the mode.
(d) Find the five-number summary.
(e) Show the box plot.
(f) Determine the outliers based on z -scores and box plot.
4. (40\%) For the following grouped data:

| Data | Frequency |
| :---: | :---: |
| $1-10$ | 2 |
| $11-20$ | 5 |
| $21-30$ | 7 |
| $31-40$ | 6 |

(a) Construct a percent frequency distribution, a cumulative relative frequency distribution and a cumulative percent frequency distribution.
(b) Construct a histogram.
(c) Construct an ogive.
(d) Compute the mean.
(e) Compute the variance.
5. (10\%) Suppose the data have a bell-shaped distribution. If the $z$-score of the data 17.5 is 2.5 and the $z$-score of the data 4 is $\mathbf{- 2}$.
(a) (4\%) Find the $z$-score of the data 13.
(b) (6\%)
(i) Determine the range within which contains approximately $95 \%$ of data.
(ii) Determine the range within which contains at least $93.75 \%$ of data.

