No 1. (10 pts)
(a) What is the major difference between an observational study and a scientific study?
(b) What is cluster sampling, and describe when it may be appropriate to be used?
No 2. (20 pts) Two four sides dice (each die is in the shape of a tetrahedron) are simultaneously rolled and the color of the down faces recorded. One die has two faces colored red, one green and the other blue. The other die has one face colored red, two colored green and one colored blue.

Let A denote the event that at least one die is red, and B denote the event of green on both dice.
(a) List the 16 possible outcomes from the experiment. (Hint: Label to the two red faces R1, R2 and the green faces G1, G2.)
(b) Are A and B mutually exclusive events? (Explain your answer!)
(c) Describe in words the event A ∪ B, and compute P(A ∪ B).
(d) Compute (i) P(A)
   (ii) P(B)
   (iii) P(A ∩ B).
No 3. (20 pts) Student Services recently surveyed students to determine how much students paid annually for cellular phone services. The following data (in dollars) was collected:

361  393  430  543  566  610  763  851
886  887  976  1039  1124  1267  1328  1415
1425  1444  1476  1542  1544  2048  2190

(a) Construct a histogram of the above data. (Use 6 classes).
(b) Determine the mean and the median of the data, and describe what these two numbers represent.
(c) Compute the standard deviation and interquartile range of the data.
(d) Draw a box-and-whisker plot for the data.