Question 1:

(a)[3] Over a 9 month period an initial investment of \$23,500 earned \$1057.50 of simple interest. What was the annual rate of simple interest? (State answer as a percentage rounded to 1 decimal place.)

(b)[3] Determine the rate of interest compounded semiannually which is equivalent to an effective rate of 7.25%. (State answer as a percentage rounded to 1 decimal place.)

(c)[4] An amount P is invested at 5% compounded quarterly. An amount of \$300 is invested separately at 4% compounded continuously. The total value of both investments after two years is \$1000. Determine the value of P. (Round final answer to 2 decimal places.)

Question 2:

(a)[5] Determine the payments that must be made to an investment at the end of each month for the next 20 years in order to accumulate \$120,000. The investment earns interest at a rate of 5.3% compounded monthly. (Round final answer to 2 decimal places.)

(b)[5] On his 40th birthday Mr. Smithers decides to get serious about his retirement plan. His goal is to have \$1,000,000 saved by his 65th birthday. He currently has \$100,000 in a fund which earns interest at 6% compounded annually. How much should he contribute to the fund at the end of each year to reach his goal? (Round final answer to 2 decimal places.)

Question 3:

(a)[5] A credit card charges 19% interest compounded monthly. Suppose you use the credit card to make a purchase today, and in order to pay off the credit card you will be required to make payments of $122 at the end of each month for the next three years. What was the cost of the purchase you made? (Round final answer to 2 decimal places.)

(b)[5] A 30 year old plans to retire at age 60. He plans to make deposits at the end of each month for the next 30 years into an account paying 4.6% compounded monthly so that when he retires he can withdraw $300 at the end of each month for 35 years. How much should the monthly deposits be? (Round final answer to 2 decimal places.)

Question 4: For this question use the following sets:

$$U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}, \quad A = \{2, 4, 6, 8\}, \quad B = \{2, 3, 4, 5, 6\}, \quad C = \{1, 2, 3, 8, 9\}$$

Determine the following:

(a)[2] $A \cap B$

(b)[2] $\overline{A} \cap C$

(c)[2] $B \cap (A \cup C)$

(d)[2] $B \cup \overline{(A \cup C)}$

(e)[2] $n(A \cup B) - n(A \cap B)$

Question 5:

(a)[3] A survey of 100 households finds that 76 have a DVD player, 21 have a Blue Ray player, while 12 households have both. How many households have neither machine?

(b)[7] A survey of 150 investors resulted in the following data:

111 invested in stocks;
98 invested in bonds;
100 invested in GICs;
80 invested in stocks and bonds;
83 invested in bonds and GICs;
85 invested in stocks and GICs;
80 invested in all three investments

How many investors invested in stocks but not GICs?