**Chapter 6 TEST**

**Part I – No calculator**

1. Which of the following is the slope field for the differential equation: ? [1]

A B
  
C D
  
2. Show that is a solution of the differential equation . [1]
3. Solve the differential equation (that satisfies the initial condition when given): [4.5]

a)

b) ,

c) ,
4. Evaluate the following integrals: [20.5]

a)

b)

c)

d)

e)

f)

g)

h)

i)

j)

k)

l)
5. Evaluate the following definite integrals: [6]

a)

b)

c)

**Chapter 6 TEST
Part II – Calculator Allowed**

1. Newton’s Law of Cooling states that the rate of cooling of an object is proportional to the temperature difference between the object and its surroundings. Suppose that a roast turkey is taken from an oven when its temperature has reached 185oF and is placed on a table in a room where the temperature is 75oF.

a) If the temperature of the turkey is 150oF after half an hour, what is the temperature after 45min? [2]

b) When will the turkey have cooled to 100oF? [1]
2. How long will it take an investment to double in value if the interest rate is 6% compounded continuously?

 [1]

1. A tank contains 20kg of salt dissolved in 5000 L of water. Brine that contains 0.03 kg of salt per liter of water enters the tank at a rate of 25 L/min. The solution is kept thoroughly mixed and drains from the tank at the same rate. How much salt remains in the tank after half an hour? [3]