|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| C:\Users\Asus\Desktop\Logo UTHM.jpg  **FSKTM** | Subject Code | **BIC 10103** | Item No. | **Tutorial 07** |
| Subject | **Discrete Structure** | Date | **20/12/2022** |

**Objective :** To enhance the skill of recurrence relations.

**NAME : …………………………………………………….**

**MATRIC NO. : …………………………………………………….**

1. A male usurer lends money at unreasonable rates of interest. He demands to be paid 10% interest on a loan, compounded weekly. Suppose you borrow RM500 from him. Calculate the total of money you owe if you wait two months to pay him back.
2. Formulate a solution to the following recurrence relations.
3. 𝑎𝑛 = 3𝑎𝑛−1 − 2𝑎𝑛−2 where 𝑎0 = 1 and 𝑎1 = 2.
4. 𝑎𝑛 = 6𝑎𝑛−1 − 9𝑎𝑛−2 where 𝑎0 = 1 and 𝑎1 = 6.
5. Every spring a nearby are stocked with 5000 catfish. Due to fishing and environmental conditions, the population of catfish n weeks after the stock date is given by

Starting with the first week and continuing until there are no catfish left. Find a closed formula for the number of catfish n weeks after the stock date. What is the value of n when lake has no catfish?

1. A single pair of rabbits (male and female) is born at the beginning of a year. Assume the following conditions (which are more realistic than Fibonacci’s):
2. Rabbit pairs are not fertile during their first month of life but there after give birth to four new male/female pairs at the end of every month.
3. No rabbits die.

Let rn to be the number of pairs of rabbits alive at the end of month n, for each integer n≥1, and let r0 =1. Find a recurrence relation for r0, r1, r2, r3, r4, r5 and r6. How many rabbits will there be at the end of the year?