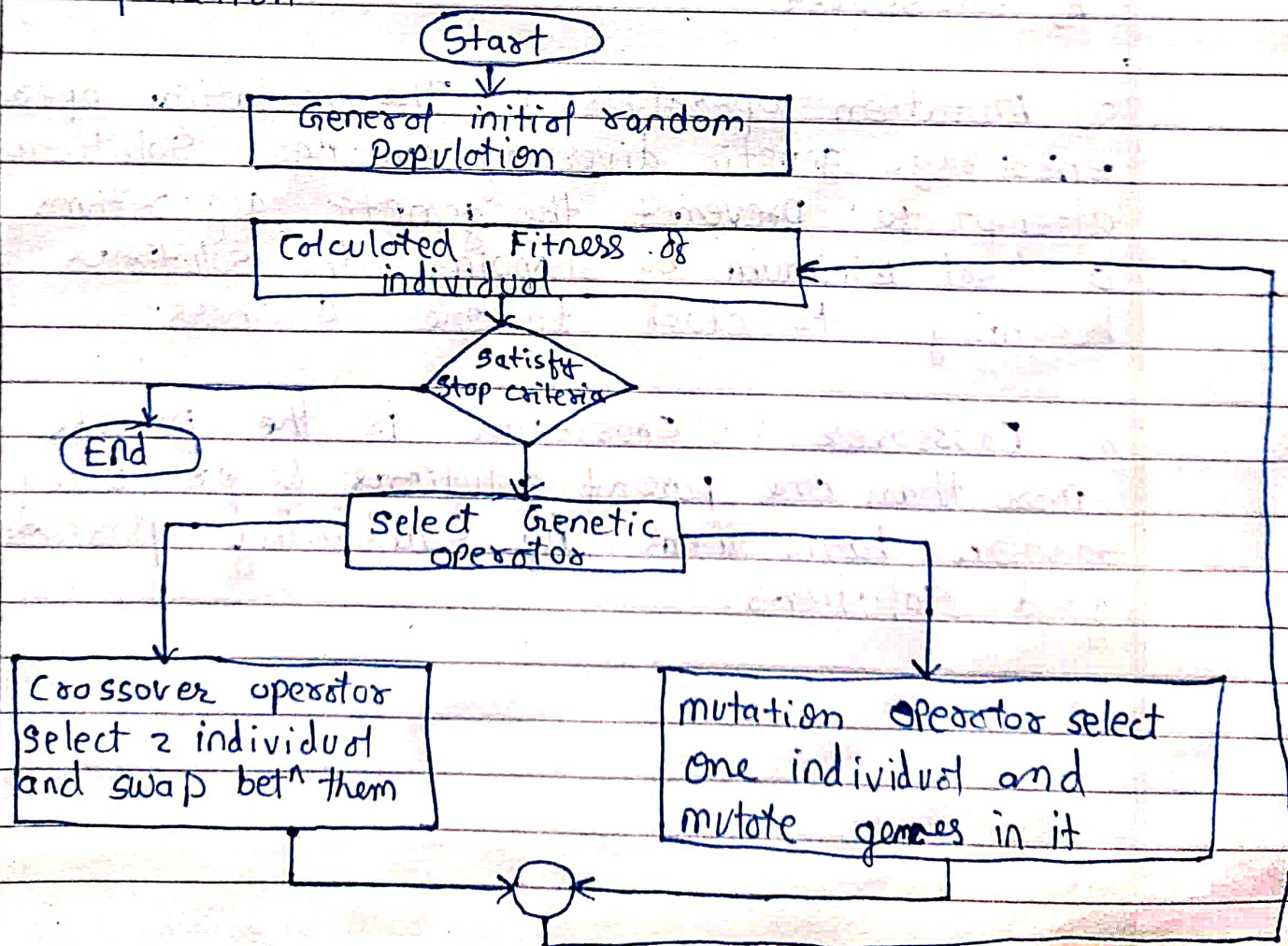SCOA

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Q.1) Enlist the basic steps of Genetic Algorithm with flow chart.

Ans : i) Genetic Algorithms are adaptive heurostic search algorithm based on evolutionary ideas of natural selection and genetics.

ii) GA's are often used to find optimal or near optimal solution to difficult problems which otherwise would take a lifetime to solve

iii) GA's is a subset of an evolutionary computation

```
                    ┌─────────┐
                    │  Start  │
                    └────┬────┘
                         ↓
          ┌──────────────────────────────┐
          │  General initial random      │
          │       Population             │
          └──────────────────────────────┘
                         ↓
          ┌──────────────────────────────┐
          │  Calculated Fitness of       │←──────────┐
          │       individual             │           │
          └──────────────┬───────────────┘           │
                         ↓                            │
                    ◇ satisfy ◇                       │
                    ◇ Stop criteria ◇                 │
   ┌─────┐          ◇         ◇                       │
   │ End │←─────────                                  │
   └─────┘               ↓                            │
              ┌──────────────────────┐               │
              │  Select Genetic      │               │
              │     operator         │               │
              └──────────────────────┘               │
              ↓                        ↓              │
  ┌────────────────────────┐  ┌────────────────────────┐
  │ Croossover operator    │  │ mutation operator select│
  │ select 2 individual    │  │ one individual and     │
  │ and swap betⁿ them      │  │ mutate genes in it     │
  └────────────────────────┘  └────────────────────────┘
              └──────────────┐   ┌──────────────────────┘
                          ↓  ⊗
```

iv] ~~Genetic~~ In GAs we select the initial pool or a problem of possible Solutions to the given problem.
- Application of Genetic Algorithms.
1) Automative design
2) Engineering design
3) Robotics.

Q.2 Explain Genetic operations ?
Ans: After the selection process, we perform the crossover operation different types of cross over operators can be used. These are 2 main types of operators.
 a) Mutation.
 b) Crossover

a) Mutation operators :- The mutation operators encourage genetic diversity amongst solutions and attempt to prevent the genetic algorithms covering a local minimum by stopping the solutions becoming to close to one anothers.

b] Crossover : Crossever is the process of taking more than one parent solutions & producing a child solution from them by combining portions of good solutions.