SCOA Assignment - 04

Name- Praddyumn Wadekar
Class- BE Comps
PRN = 517111038

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Q1] Enlist the basic steps of genetic algorithm with flowchart

→ Basic steps of genetic Algorithm :-

a) Initialize a population with randomly generated individuals & evaluate the fitness value of each

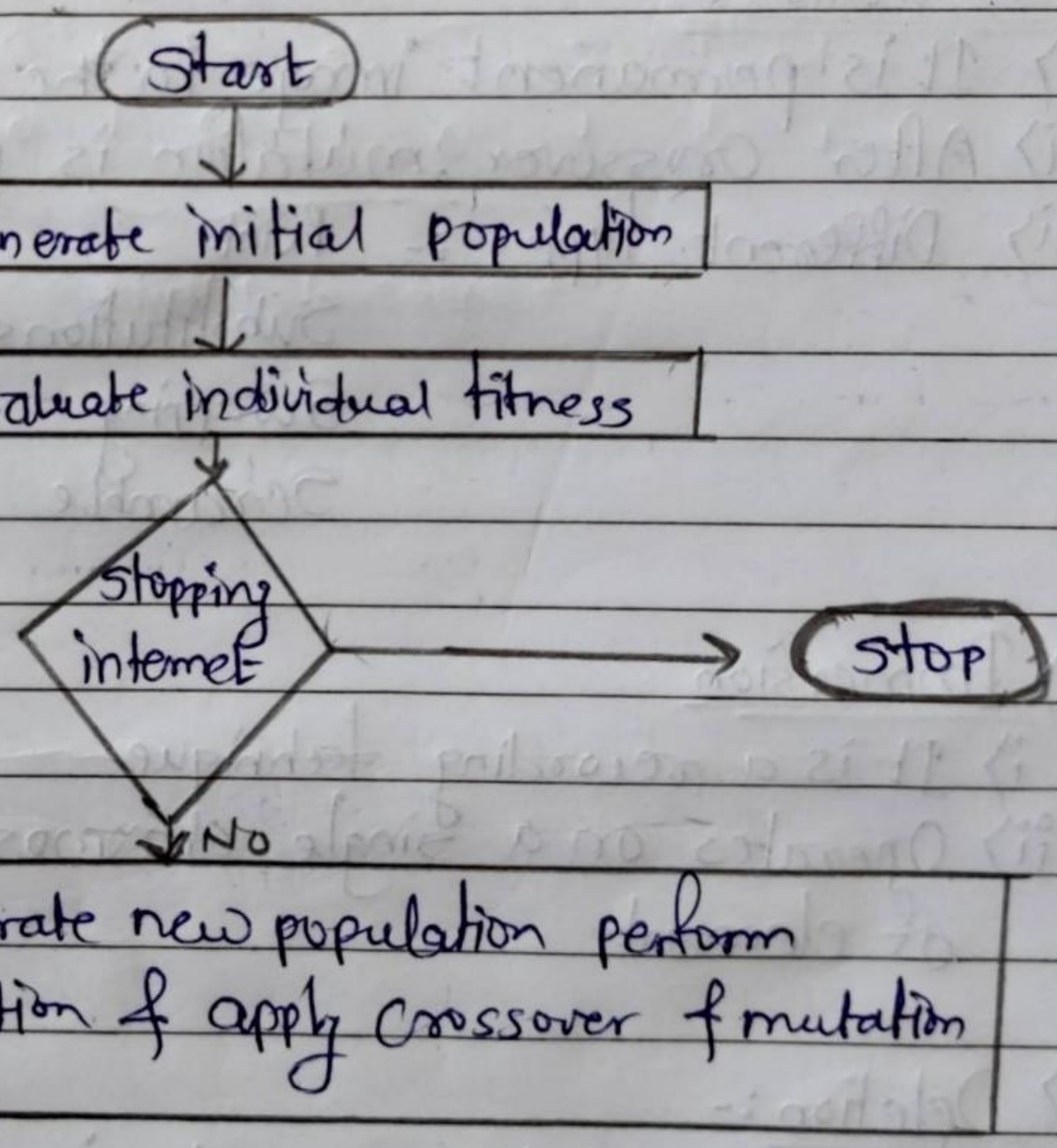
b) Select two individuals from the population with probability proportional to their respective fitness values

c) Apply crossover on the two individuals selected with a probability equal to crossover rate

d) Apply mutation with a probability equal to mutation rate

e) Repeate from (b) to (d) until enough numbers are generated to form the next generation

f) Continue till stopping criteria is met



Q2] Explain Genetic Operators :-

→ i) Different genetic operators are :-

a) Crossover :-

i) After selection phase, crossover is performed
ii) It is performed on the best chromosomes which are selected ab parents
iii) This operations produces offsprings
iv) Crossover is applied to get a better string
v) Different crossover operators are :-
   1) Single point crossover
   2) Two point Crossover
   3) Multipoint Crossover
   4) Uniform Crossover
   5) Matrix Crossover

b) Mutation :-
i) It is permanent image in the sequences of DNA
ii) After crossover, mutation is performed
iii) Different types :- Point
   Substitutions
   Swapping
   Scramble

c) Immersion
i) It is a recording technique
ii) Operates on a single chromosomes & inverts the order of element

d) Deletion :-
i) Usually, deletion operator is used in combination with other operators like duplications, regenerations, addition, etc

e) Deletion & Duplication

i) 2 or 3 bits are selected at random & the previous bits are duplicated

0	0	1	0	0	1	0	Before
0	0	1	0	-	-	0	At
0	0	1	0	1	0	0	After

f) Deletion & Regeneration

i) Bits between 2 crosspoints are deleted & regenerated randomly

1 1 0 1 0 1 1 0

1 1 - - - - - 0 Deletion

1 1 1 0 1 0 1 0 Regeneration

Regenerated bits