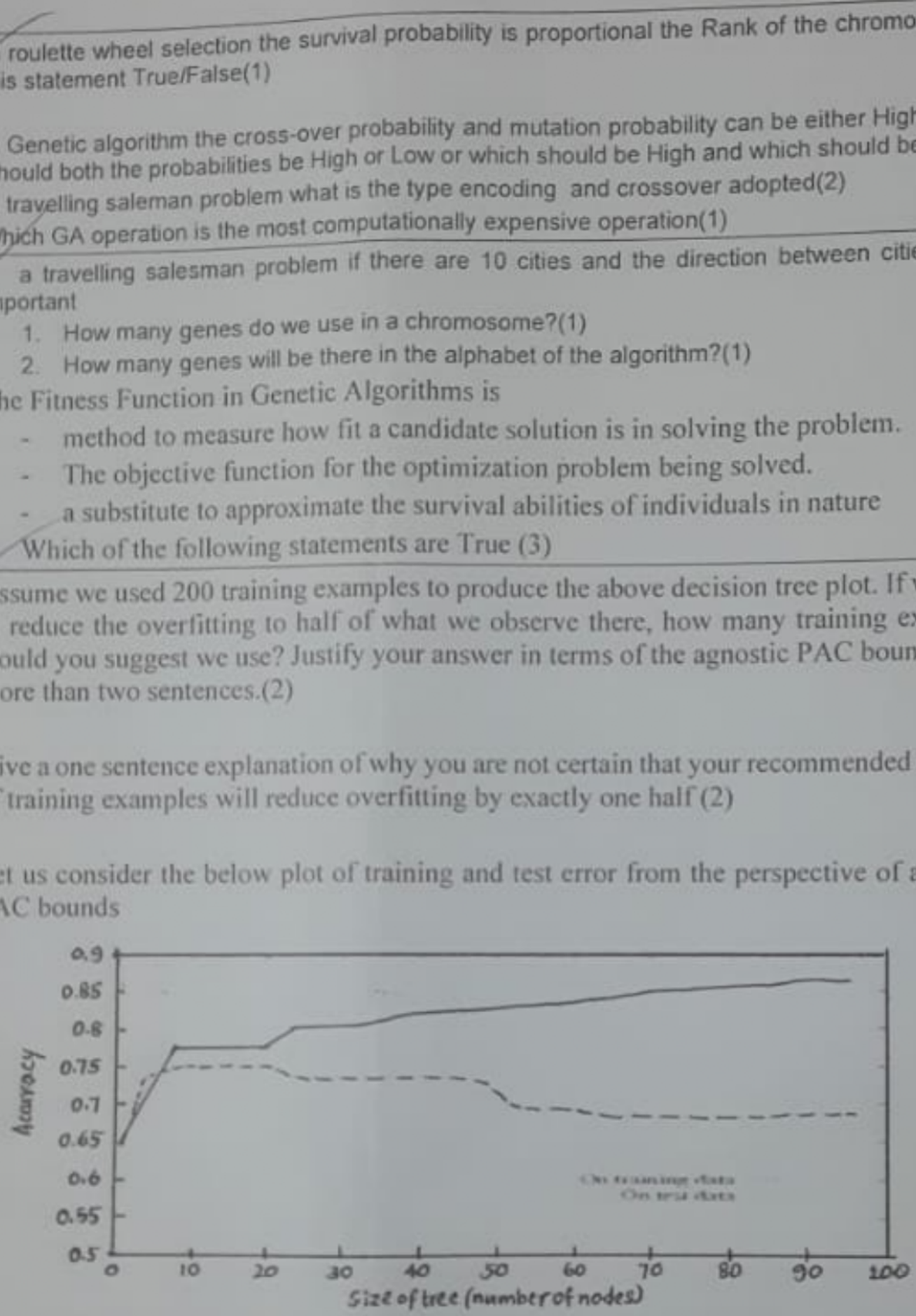
5.	a)	In roulette wheel selection the survival probability is proportional the Rank of the chromosome. Is this statement True/False(1) In Genetic algorithm the cross-over probability and mutation probability can be either High or Low. Should both the probabilities be High or Low or which should be High and which should be low?(1) In travelling saleman problem what is the type encoding and crossover adopted(2) Which GA operation is the most computationally expensive operation(1)	5
	b)	In a travelling salesman problem if there are 10 cities and the direction between cities is not important 1. How many genes do we use in a chromosome?(1) 2. How many genes will be there in the alphabet of the algorithm?(1) The Fitness Function in Genetic Algorithms is - method to measure how fit a candidate solution is in solving the problem. - The objective function for the optimization problem being solved. - a substitute to approximate the survival abilities of individuals in nature Which of the following statements are True (3)	5
	c)	Assume we used 200 training examples to produce the above decision tree plot. If we wish to reduce the overfitting to half of what we observe there, how many training examples would you suggest we use? Justify your answer in terms of the agnostic PAC bound, in no more than two sentences.(2) Give a one sentence explanation of why you are not certain that your recommended number of training examples will reduce overfitting by exactly one half (2) Let us consider the below plot of training and test error from the perspective of agnostic PAC bounds  Consider the agnostic PAC bound $$m \geq \frac{1}{2\epsilon^2}(\ln |H| + \ln(1/\delta))$$ where e is defined to be the difference between errortrue(h) and errortrain(h) for any hypothesis h output by the learner. State in one carefully worded sentence what the above PAC bound guarantees about the two curves in our decision tree plot above(2)	6
	d)	State which of the following are True/False PSO carries out both local and global search (1) PSO is faster and less computationally expensive then GA (1) PSO generally solves minimization problems (1) In PSO cognitive part of the equation requires the global best (1)	4