Extra Practice Questions for the Final
(No answer will be given, try to work it out)

True/False

_____ 1. You pick a day of the week at random. Let event A be "the day picked starts with the letter 'S.'" The complement of A is "the day picked starts with the letter 'M,' 'F,' 'T,' or 'W.'"

_____ 2. Event A: You shuffle a deck of cards and choose one at random, picking an ace. Event B: You choose an ace again, after returning the previous card to the deck and reshuffling. Events A and B are independent.

_____ 3. There is no mode for the data set 2, 4, 8, 8, 4, 4, 4, 8, 2, 2, 2, 8.

_____ 4. The Traveling Salesman Problem refers to finding the shortest path on a graph.

Multiple Choice _or Short Answer_

_____ 1. How many distinct outcomes are in the sample space created by listing all possible zip codes in the United States? Assume a zip code is a string of 5 digits, where each digit may be 0-9.

_____ 2. You have three fair six-sided dice and you roll each die once. You count the sum of the numbers facing up on each die. What is the theoretical probability of rolling a sum of 13?

_____ 3. When you go grocery shopping, you take note of the color of the car that is parked next to you on the left side. Over twenty trips, you've parked next to 5 blue cars, 4 green cars, 6 black cars, 2 red cars, and 3 white cars. What is the probability that on your next trip you will not park next to a red or green car on the left side?

_____ 4. You roll a fair six-sided die and then re-roll it. What are the odds in favor of the number on the second roll the same as the number on the first roll?

_____ 5. The hockey and basketball teams are voting on captains. There is a 30% chance Morgan will be elected captain of the hockey team, a 10% chance Morgan will be elected captain of both teams, and a 50% chance Morgan will be elected captain of at least one of the teams. What is the probability Morgan will be elected captain of the basketball team?

_____ 6. You own 7 polo shirts and need to pack 5 of them for a trip. They will be packed stacked on top of each other in your suitcase. How many different stacks are possible?

_____ 7. How many 8-digit binary numbers contain less than three ones?

_____ 8. The scores on a test are as follows: 97, 67, 73, 93, 80, 85, 71, 99, 88, 89. You are going to construct a box-and-whisker plot of this data. What is the interquartile range?

_____ 9. What is the median of the numbers 11, 17, 25, 25, 17, 11?

_____ 10. What is the sample variance of the following data set: 343, 643, 690, 563?

_____ 11. What is the sample standard deviation of the following data set: 5, 6, 7, 8, 9?

_____ 12. A certain test score is normally distributed with mean 4 and standard deviation 1. What test score marks the point where 50% of the test-takers fall below that score?

_____ 13. You flip a biased coin 20 times. The coin will come up heads 80% of the time. What is the standard deviation of the number of heads you will get?

_____ 14. What is the correlation coefficient (r) for the data points (5, 4), (10, 4), (7,5) and (12, 3)?
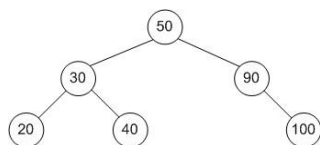
_____ 15. What is the postorder traversal of the tree above?

_____ 16. What is the preorder traversal of the tree above?

_____ 17. What is adjacency matrix of the tree (graph) above?
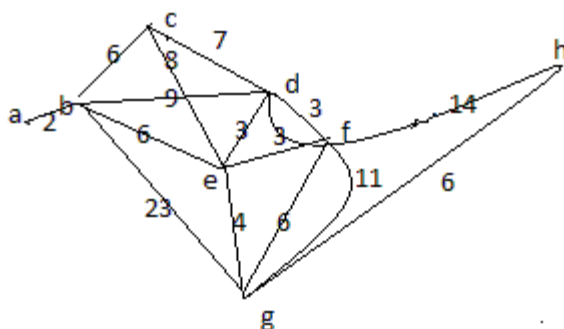
_____ 18. What is the shortest path from vertex a to h in the accompanying graph?

_____ 19. What is the size of the graph above?

_____ 20. Is there a bridge in the graph above? If yes, where is it?

In the tree below, each left-child represents a binary 0 and each right-child represents a binary 1. The leaf nodes have a letter from the alphabet as a label. When a leaf is reached, the label is appended to a generated string.

root

g n

i

d

r
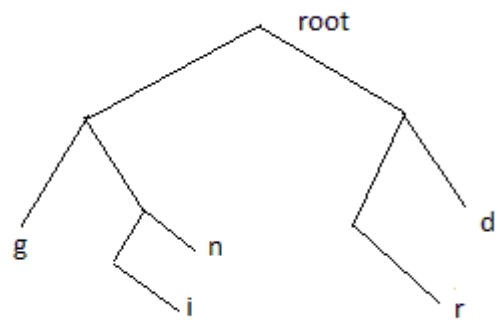
_____ 21. Using the accompanying figure, the Huffman Code 001010101011 generates the string.