Quiz 4
Discrete Structures - Spring 2024

Time: 20 Mins Name:
Total Marks: 10 ID:
Note: Cutting or over-writing is not acceptable.
Show your working otherwise no credit will be given.

Question # 1 (CLO 3 – 5 Marks)

Apply *Basic Counting Principles to answer the following questions? Also Show working.*

1) A particular brand of shirt comes in 12 colors, has a male version and a female version, and comes in three sizes for each sex. How many different types of this shirt are made?

a) 6
c) 24
b) 36
d) 72

2) How many positive integers between 50 and 100 are divisible by 7?

a) 7
c) 21
b) 43
d) 50

3) How many bit strings of length nine both begin and end with a 1?

a) 2^9
c) 2^7
b) 2^8
d) 2^6

4) A committee is formed consisting of one representative from each of the 50 states in the United States, where the representative from a state is either the governor or one of the two senators from that state. How many ways are there to form this committee?

a) 3^{50}
c) 2^{50}
b) 50^3
d) 50^2

5) A computer access code word consists of from one to three letters of English alphabets with repetitions allowed. How many different code words are possible??

a) 26
c) 17576
b) 676
d) 18278

Question # 2 (CLO 3 – 5 Marks)

Apply *Pigeonhole Principle to answer the following questions?*

6) How many numbers must be selected from the set {1, 3, 5, 7, 9, 11, 13, 15}to guarantee that at least one pair of these numbers add up to 16?

a) 8
c) 7
b) 6
d) 5

7) There are 38 different time periods during which classes at a university can be scheduled. If there are 677 different classes, how many different rooms will be needed?

a) 16
c) 17
b) 18
d) 19

8) A drawer contains a dozen brown socks and a dozen black socks, all unmatched. A man takes socks out at random in the dark. How many socks must he take out to be sure that he has at least two socks of the same color?

a) 2
c) 3
b) 4
d) None

9) How many integers from 0 through 60 must you pick in order to be sure of getting at least one that is odd?

a) 30
c) 31
b) 32
d) None

10) How many minimum cards must you pick from a standard 52-card deck to be sure of getting at least 1 red card?

a) 52
c) 26
b) 14
d) 27