Self-Assessment Quiz

Discrete Mathematics

(Factorial, Permutation, Combination, Pigeonhole Principle)

Instructions: This quiz is for self-assessment only. There is no grading.

Multiple Choice Questions

Q1. The value of 5! is:

(a) 20

(b) 60

(c) 120

(d) 240

Q2. Which of the following is true?

(a) $0! = 0$

(b) $1! = 0$

(c) $0! = 1$

(d) $1! = 2$

Q3. The number of ways to arrange 4 distinct objects is:

(a) 4

(b) 8

(c) 12

(d) 24

Q4. How many permutations of the word **BOOK** are possible?

(a) 12

(b) 24

(c) 6

(d) 4

Q5. The formula for permutations of n objects taken r at a time is:

(a) $\frac{n!}{(n-r)!}$

(b) $\frac{n!}{r!(n-r)!}$

(c) n^r

(d) $r!$

Q6. The value of ${}^5P_3$ is:

(a) 10

(b) 20

(c) 60

(d) 120

Q7. Which situation represents a permutation?

(a) Selecting 3 students from a class

(b) Choosing a committee

(c) Arranging books on a shelf

(d) Selecting cards from a deck

Q8. The formula for combinations of n objects taken r at a time is:

(a) $\frac{n!}{(n-r)!}$

(b) $\frac{n!}{r!(n-r)!}$

(c) n^r

(d) r^n

Q9. The value of ${}^6C_2$ is:

(a) 12

(b) 15

(c) 20

(d) 30

Q10. Which of the following is true?

(a) ${}^nP_r = {}^n C_r$

(b) ${}^nC_r = {}^n C_{n-r}$

(c) ${}^nP_r = r!$

(d) ${}^nC_r = n!$

Q11. How many ways can a committee of 3 be chosen from 8 people?

(a) 24

(b) 56

(c) 336

(d) 512

Q12. The number of subsets of a set with 4 elements is:

(a) 8

(b) 12

(c) 16

(d) 24

Q13. Which principle guarantees that at least two objects share a property?

(a) Inclusion Principle

(b) Induction Principle

(c) Pigeonhole Principle

(d) Counting Principle

Q14. If 13 people are placed in 12 rooms, at least one room will contain:

(a) Exactly one person

(b) At least two people

(c) At most two people

(d) No people

Q15. What is the minimum number of socks required to guarantee a matching pair, if there are 5 different colors?

(a) 5

(b) 6

(c) 10

(d) 11

Q16. Which of the following is an application of the Pigeonhole Principle?

(a) Solving equations

(b) Sorting algorithms

(c) Guaranteeing shared birthdays

(d) Matrix multiplication

Q17. The value of ${}^{7}C_{0}$ is:

(a) 0

(b) 1

(c) 7

(d) Undefined

Q18. If order does NOT matter, which concept is used?

(a) Permutation

(b) Factorial

(c) Combination

(d) Pigeonhole Principle

Answer Key

Q1: (c)	Q2: (c)	Q3: (d)	Q4: (a)
Q5: (a)	Q6: (c)	Q7: (c)	Q8: (b)
Q9: (b)	Q10: (b)	Q11: (b)	Q12: (c)
Q13: (c)	Q14: (b)	Q15: (b)	Q16: (c)
Q17: (b)	Q18: (c)		