Gandaki University

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Bachelor of Information Technology (BIT)

BSM 102

Exercise 1

Permutation & Combination

Classwork Set

1. In how many ways can the letter of the word MISSISSIPPI be arranged?
2. In how many ways can 7 students from a ring?
3. In how many ways can 6 beads of different colors form necklace?
4. How many numbers of three different digits can be formed from integers $1, 2, 3, 4, 5, 6, 7$?
5. In how many ways can a president, a vice president, a secretary, and a treasurer be selected from an organization with 20 members?
6. A committee of 5 members is to be chosen from 9 ladies and 8 men. In how many ways can this be done if the committee commands a lady majority?
7. How many four digit numbers can be formed from the digits $1, 3, 5, 7, 8, 9$ (i) if each digit may be used once in each number? (ii) if each digit may be used repeatedly in each number?
8. How many numbers between 2000 and 4000 can be formed with the digits $1, 2, 3, 4, 5, 6$ if repetition is not allowed?
9. In how many of the permutations of 10 different things taken 5 at a time, when 2 particular things never occur?
10. Find n, if ${}^{n}P_3 = 60$
11. If ${}^{n}C_2 = {}^{n}C_3$ then find the value of ${}^{n}C_4$

Homework Set

1. a. Compute ${}_nP_n$. b. Compute ${}_nP_1$. c. Find $\frac{(n+1)!}{n!}$. d. Find $\frac{(2n+2)!}{(2n)!}$.

   e. If $(n+1)! = 17n!$, find n. f. If $(n+1)! = 30(n-1)!$, find n.

2. a.Compute ${}_{100}C_{98}$. b. Compute ${}_{80}C_{76}$. c. Compute ${}_4C_4$. d. Compute ${}_3C_1$.

   e. Compute $\begin{pmatrix} 5 \\ 0 \end{pmatrix}$. f. Compute $\begin{pmatrix} n \\ 0 \end{pmatrix}$. g. If ${}_nC_6 = {}_nC_4$, find n. h. If ${}_nC_8 = {}_nC_7$, find n.

3. List all permutations of four digits $1, 2, 3, 4$, taken all at a time.

4. List (a) all permutations, (b) all combinations, of 5 letters a, e, i, o, u taken 2 at a time.

5. In how many ways can we assign 8 workers to 8 jobs (one worker to each job and conversely)?

6. How many samples of 4 objects can be drawn from a lot of 80 objects?

7. In how many different ways can we choose a committee of 3 from 20 persons? First guess.

8. In how many different ways can we select a committee consisting of 3 engineers, 2 biologists, and 2 chemists from 10 engineers, 5 biologists, and 6 chemists? First guess.

9. A student is required to answer 6 questions which are divided into two groups each containing 5 questions, and that student is not permitted to attempt more than 4 from any group. In how many different ways can the student make up choice.

10. There are 5 boys and 4 girls. In how many ways can they stand in a row so that (a) they may stand anywhere (b) no two girls are together (c) all girls sit together

11. How many 10-digits cell phone numbers can be constructed with the digits 0,1,2,3,4,5,6,7,8,9 if each number starts with 98

12. A person has 12 acquantiances of whom 8 are relatives. In how many ways can he invite 7 guests so that 5 of them must be relative?

13. In how many ways can 5 IT students and 5 Law students be arranged alternately at a round table?

14. How many numbers of different digits between 4000 and 5000 can be formed with the integer 2,3,4,5,6,7?

15. In how many different ways can the letters of the word MONDAY be arranged ? How many arrangements begin with M ? How many begin with M and do not end with N ?

16. Find the number of numbers that are greater than 4000 which can be formed using the digits $0, 2, 4, 6, 8$ without repetition.

17. During a national television advertising campaign, Meat Lover's Pizza stated that for Rs. 1550, you could get 2 medium-sized pizzas, each with any of 0 to 5 toppings chosen from 11 that are available. The commercial asked the question, How many different pairs of pizzas can you get? Answer the question, if the first pizza has a thin crust and the second has a thick crust.

18. If ${}^{n}p_3 = 1320$, find n.