18MAB302T: Discrete Mathematics for Engineers

Unit – II

1. An ordered arrangement of r elements of a set containing n distinct elements is called _____

   a) n-factorization c) an n-permutation of r elements

   b) r- factorization **d) an r-permutation of n elements**

2. The value of p(n, r) = _____

   a) $\frac{r!}{(r-n)!}$ b) $\frac{r!}{(n-r)!}$ **c)** $\frac{n!}{(n-r)!}$ d) $\frac{n!}{(n+r)!}$

3. The value of p(n, n) = _____

   a) $n!$ b) $\frac{r!}{(n-r)!}$ **c)** $(n+1)!$ d) $\frac{n!}{(n+r)!}$

4. When repetition of n elements obtained in a set is permitted in r – permutations, then the number of r – permutations is _____

   a) r^r b) r^n c) n^n **d) n^r**

5. The value of C(n, r) = _____

   a) $\frac{r!}{(r-n)!}$ b) $\frac{r!}{(n-r)!}$ **c)** $\frac{n!}{r!(n-r)!}$ d) $\frac{n!}{(n+r)!}$

6. The value of C(n, 0) = _____

   a) $\frac{r!}{(r-n)!}$ b) 1 **c)** $\frac{n!}{(n-r)!}$ d) 0

7. If n pigeons are accommodate in m pigen-holes and n > m, then atleast one pigeonhole will contain _____

   a) two or more pigens c) two or three pigens

   c) only three pigens d) only two pigens

8. Assuming that repetitions are not permitted, how many four – digit numbers can be form the six digits 1, 2, 3, 5, 7, 8?

   a) 120 **b) 360** c) 300 d) 400

9. What is the number of arrangements of all the six letters in the word PEPPER?

   a) **60** b) 32 c) 20 d) 70

10. Assuming that repetitions are not permitted, how many of these numbers are less than 4000, from the six digits 1, 2, 3, 5, 7, 8?

    a) 180 b) 360 c) 300 d) 400

11. In how many ways can 6 boys and 4 girls sit in a row?

    a) **10!** b) 9! c) 2! d) 1!

12. From a club consisting of 6 men and 7 women, in how many ways can we select a committee of 3 men and 4 women?

    a) 100ways b) 720 ways c) 360 ways **d) 700 ways**

13. From a club consisting of 6 men and 7 women, in how many ways can we select a committee of 4 persons which has at least one woman?

    b) 100ways b) 720 ways c) 360 ways **d) 700 ways**

14. If A and B are finite subsets of a finite Universal set U, then |AUB| = ___

    a) $|A| + |B| + |A \cap B|$ **c) $|A| + |B| - |A \cap B|$**

    b) $|A| + |B| - |A \cup B|$ d) $|A| - |B| + |A \cap B|$

15. How many permutations are there for the 8 letters a, b, c, d, e, f, g, h?

    a) **256** b) 240 c) 526 d) 625

16. There are 3 piles of identical red, blue and green balls, where each pile contains atleast 10 balls. In how many ways can 10 balls be selected if there is no restriction?

    a) 20 b) 60 **c) 66** d) 10

17. If a/b and a/c, then _____

    a) a/(b-c) **b) a/(b+c)** c) b/(a+c) d) c/(b+c)

18. A positive integer > 1 and is not prime is called _____

    a) **composite** b) decomposite c) non-composite d) None

19. Every integer n > 1 can be written uniquely as a product of ____

    a) permutation **c) Prime number**

    b) factorial d) composite

20. If n > 1 is a composite integer and p is a prime factor of n, then ___

a) $P \geq \sqrt{n}$ b) $P < \sqrt{n}$ c) $P > \sqrt{n}$ **d)** $P \leq \sqrt{n}$

21. The number of prime numbers is _____

a) indefinite b) finite **c) infinite** d) un-finite

22. If a, b are any integers, which are not simultaneously zero, and k is a positive integer, then _____

a) **gcd(ka, kb) = k gcd(a, b)** c) gcd(ka, kb) = gcd(a, b)

b) gcd(a, kb) = k gcd(a, b) d) gcd(a, b) = k gcd(a, b)

23. If a and b are two positive integers, then gcd(a, b) . lcm (a, b) = __

a) 1 b) a c) b **d) ab**

24. Find the prime factorization of 10!

a) $\mathbf{2^8 . 3^4 . 5^2 . 7}$ c) $2^8 . 3^4 . 5^2$

b) $3^4 . 5^2 . 7$ d) $3^4 . 5^2 . 7$

25. LCM (24, 30) = ____

a) 6 b) 24 **c) 120** d) 30

26. If gcd (a, b) = 1, then for any integer c, gcd(ac, b) = _____

a) lcm (a, b) **b) gcd(c, b)** c) gcd(a, b) d) lcm(c, b)

27. How many positive integers n can be formed using the digits 3, 4, 4, 5, 5, 6, 7, if n has to exceed 50,00,000?

a) 700 **b) 720** c) 420 d) 2520

28. In how many ways can 2 letters be selected from the set {a,b,c,d} when repetition of the letters is allowed if the order of the letters matter?

a) 8 b) 4 **c) 16** d) 2

29. In any group of six people, how many people must be mutual friends or how many people must be mutual strangers.

a) 3 mutual friends **c) 3 mutual friends and 3 mutual strangers**

b) 3 mutual strangers d) 1 mutual friends and 2 mutual strangers

30. In how many different ways can the letters in the word MISSISSIPPI be arranged if there is no restriction?

a) 46350 b) 24 c) 36540 **d) 34650**

31. Find integers m and n such that 28844m + 15712n = 4.

a) -1693, 3108 b) -3108,2091 c) -1963,2345 d) 1693,1234

32. Let a, b, c Z, the set of integers, if a/b and a/c then

a) a/(b - c) **b) a/(a + c)** c) b/(a + c) d)(b + c)/a

33. Find the prime factorization of 45,500.

a) $\mathbf{2^2.5^3.7.13}$ b) $2^3.5^2.7.13$ c) $2.5.7^3.13^2$ d) $5.7^3.3^2$

34. Using prime factorization, find the gcd of 337500, 21600.

a) **2700** b) 2100 c) 3375 d) $2{\cdot}3^{2{\cdot}}5^2$

35. Using prime factorization, find the lcm of 337500, 21600.

a) 2700 **b) 2700000** c) 33500 d) 337500

36. If we select 10 points in the interior of an equilateral triangle of side 1 then there must be atleast two points whose distances apart is

a) less than 1/2 **b) less than 1/3**

c) greater than 1/2 d) greater than 1/3

Answers:

1	d	2	c	3	a	4	d	5	c	6	b	7	a	8	b	9	a	10	a
11	a	12	d	13	d	14	c	15	a	16	c	17	b	18	a	19	c	20	d
21	c	22	a	23	d	24	a	25	c	26	b	27	b	28	c	29	c	30	d
31	a	32	b	33	a	34	a	35	b	36	b								