**18MAB302T: Discrete Mathematics for Engineers**

**Unit – II**

1. An ordered arrangement of r elements of a set containing n distinct elements is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. n-factorization c) an n-permutation of r elements
3. r- factorization **d)** **an r-permutation of n elements**
4. The value of p(n, r) = \_\_\_\_\_\_
5. b)  **c)**  d)



1. The value of p(n, n) = \_\_\_\_\_\_
2. b)  **c)**  d)



1. When repetition of n elements obtained in a set is permitted in r – permutations, then the number of r – permutations is \_\_\_\_\_
2. rr b) rn c) nn **d) nr**
3. The value of C(n, r) = \_\_\_\_\_\_\_\_\_\_\_
4. b)  **c)**  d)



1. The value of C(n, 0) = \_\_\_\_\_\_
2. b) 1  **c)**  d) 0



1. 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

1. Assuming that repetitions are not permitted, how many four – digit numbers can be form the six digits 1, 2, 3, 5, 7, 8?
2. 120 **b) 360** c) 300 d) 400
3. What is the number of arrangements of all the six letters in the word PEPPER?
4. **60** b) 32 c) 20 d) 70
5. 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

1. In how many ways can 6 boys and 4 girls sit in a row?
2. **10!** b) 9! c) 2! d) 1!
3. 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?
4. 100ways b) 720 ways c) 360 ways **d)** **700 ways**
5. 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?
6. 100ways b) 720 ways c) 360 ways **d)** **700 ways**
7. If A and B are finite subsets of a finite Universal set U, then |AUB| = \_\_\_
8. |A| + |B| + |AB| **c)** **|A| + |B| - |AB|**



1. |A| + |B| - |AB| d) |A| - |B| + |AB|



1. How many permutations are there for the 8 letters a, b, c, d, e, f, g, h?
2. **256** b) 240 c) 526 d) 625
3. 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?
4. 20 b) 60 **c)** **66**  d) 10
5. If a/b and a/c, then \_\_\_\_\_\_
6. a/(b-c) **b) a/(b+c)**  c) b/(a+c) d) c/(b+c)
7. A positive integer > 1 and is not prime is called \_\_\_\_\_\_\_
8. **composite** b) decomposite c) non-composite d) None
9. Every integer n > 1 can be written uniquely as a product of \_\_\_\_
10. permutation **c) Prime number**
11. factorial d) composite
12. If n > 1 is a composite integer and p is a prime factor of n, then \_\_\_
13. b) c) **d)**



1. The number of prime numbers is \_\_\_\_\_\_
2. indefinite b) finite **c)** **infinite** d) un-finite
3. If a, b are any integers, which are not simultaneously zero, and k is a positive integer, then \_\_\_\_\_\_\_
4. **gcd(ka, kb) = k gcd(a, b)** c) gcd(ka, kb) = gcd(a, b)
5. gcd(a, kb) = k gcd(a, b) d) gcd(a, b) = k gcd(a, b)
6. If a and b are two positive integers, then gcd(a, b) . lcm (a, b) = \_\_
7. 1 b) a c) b **d)** **ab**
8. Find the prime factorization of 10!
9. **28 . 34 . 52 . 7**  c) 28 . 34 . 52
10. 34 . 52 . 7 d) 34 . 52 . 7
11. LCM (24, 30) = \_\_\_\_
12. 6 b) 24 **c) 120** d) 30
13. If gcd (a, b) = 1, then for any integer c, gcd(ac, b) = \_\_\_\_\_\_
14. lcm (a, b) **b)** **gcd(c, b)**  c) gcd(a, b) d) lcm(c, b)
15. 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?
16. 700 **b) 720** c) 420 d) 2520
17. 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?
18. 8 b) 4 **c) 16**  d) 2
19. In any group of six people, how many people must be mutual friends or how many people must be mutual strangers.
20. 3 mutual friends **c) 3 mutual friends and 3 mutual strangers**
21. 3 mutual strangers d) 1 mutual friends and 2 mutual strangers
22. In how many different ways can the letters in the word MISSISSIPPI be arranged if there is no restriction?
23. 46350 b) 24 c) 36540 **d)** **34650**
24. Find integers m and n such that 28844m + 15712n = 4.
25. **-1693, 3108** b) -3108,2091 c) -1963,2345 d) 1693,1234
26. Let a, b, c ∈ Z, the set of integers, if a/b and a/c then
27. a/(b - c) **b) a/(a + c)** c) b/(a + c) d)(b + c)/a
28. Find the prime factorization of 45,500.
29. **22.53.7.13** b) 23.52.7.13 c) 2.5.73.132 d)5.73.32
30. Using prime factorization, find the gcd of 337500, 21600.
31. **2700** b) 2100c) 3375d) 2.32.52
32. Using prime factorization, find the lcm of 337500, 21600.
33. 2700 **b) 2700000**c) 33500 d) 337500
34. 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 |  |  |  |  |  |  |  |  |