18MAB302T-DISCRTE MATHEMATICS FOR ENGINEERS
Assignment Questions (Unit II)
Part-A

1. In how many ways can 6 boys and 4 girls can sit in a row?
2. Find the number of different 4-letter words with or without meanings, that can be formed from the letters of the word 'NUMBER'
3. Prove that in any group of six people, at least 3 must be mutual friends or at least 3 must be mutual strangers.
4. State fundamental theorem of arithmetic.
5. If a and b are coprime and a and c are coprime then prove that a and bc are coprime.
6. Using Euclid's algorithm, find Greatest common divisor of 540 and 168.

Part-B

7. State and proof principle of inclusion and exclusion.
8. Find the prime factorization of each of the following integers;

   (i)6647 and (ii) 45,500

9. 1. 5 balls are to be placed in 3 boxes; each can hold all the 5 balls. In how many different ways can place the balls so that no box is left empty, if
   (a) balls and boxes are different?
   (b) balls are identical and boxes are different?
   (c) balls are different and boxes are identical?
   (d) Balls as well as boxes are identical?

10. If we select 10 points in the interior of an equilateral triangle of side 1, show that there must be at least 2 points whose distance apart is less than 1/3.

11. A man hiked for 10 hrs and converted a total distance of 45 km. It is known that he hiked 6 km in the first hour and only 3 km in the last hour. Show that he must have hiked at least 9 km within a certain period of 2 consecutive hours.

12. Find the number of integers between 1 and 250 both inclusive that are not divisible by any of the integers 2, 3, 5 and 7.

13. Find the integers m and n such that 512m+320n=64.

14. Use the Euclidian algorithm to find (i) gcd (1819,3587); (ii) gcd (12345,54321). In each case express the gcd as a linear combination of the given numbers.

15. Consider a prime number 73939133, if we remove a digit from right end of the number continually, prove that all resulting number is also prime.

16. Use prime factorization, find the gcd and lcm of (i) (231,1575) and (ii) (337500,21600) verify also that gcd(m,n).lcm(m,n)=mn.