UNIT- 3

2 marks

1. If $nC_2 = nC_3$. Find the value of n.
2. Find rC_3 if $16C_r = 16C_{r+2}$.
3. If $(n+2)C_n = 45$. Find n.
4. In how many ways can be the letters of the word "MOBILE" is arranged the consonants always occupy the odd Places.
5. How many binary operations can be defined on the set which 2 elements?
6. write any two properties of combinations.
7. Define binary operation
8. If $nP_4 = 360$. Find n.
9. what are the types of binary operations?
10. Find $\frac{11C_8}{11C_7}$.
11. Define Permutations and combinations.
12. Define Boolean Algebra.
13. PT $nC_r = nC_{n-r}$
14. For any $a \in B$. PT $a+a = a$.
15. How many even numbers of 4 digit can be formed out of the digits $1, 2, 3, \cdots, 9$, if repetition of digits are not allowed?
16. ST the binary operation $*$ on $(Z^+, *)$ defined by $a*b = \max(a, b)$ is associative
17. Find the number of permutations of Six objects taken Three at a time.

5 marks

18. Explain the types of binary operations.
19. There are Three Sections in a Question Papers, each containing 5 questions. A candidate has to Solve only 5 questions choosing atleast one question from each section. In how many ways he can make his choice?
20. If $nC_r : nC_{r+1} = 1 : 2$ and $nC_{r+1} : nC_{r+2} = 2 : 3$. Find n and r

21. Find the number of ways in which 12 persons may be divided into 4 sets of 3 each, one to play lawn tennis, one to play cards, one to play badminton and one to play table tennis

22. In a Boolean algebra B, PT $a+b=a+c$ and $a*b=a*c \Leftrightarrow b=c$. for $a, b, c \in B$.

23. Define on Z, $a*b=a-b$, $\forall\ a, b \in Z$. PT $*$ is not associative.

24. For $a, b \in B$. PT (i) $(a.b)' = a'+b'$
(ii) $(a+b)' = a'.b'$

25. PT $nP_n = (n-1)P_n + n(n-1)P_{n-1}$

26. From 6 gentleman and 4 ladies a Committee of 5 is to be formed. In how many ways can this be done so as to include atleast one lady?

27. Find the number of ways of arrangement of letters of the word "MISSISSIPPI".

28. ST $b=c$ iff $a+b=a+c$ and $a.b=a.c$

10marks

29. A cricket team of 12 players is to be formed from 20 players including 6 bowlers and 3 wicket keepers. In how many ways can team be formed so that the team contains exactly 2 wicket keepers and atleast 4 bowlers?

30. Find the number of diagonals in polygon of 'n' sides. How many triangles can be made?

31. Find the sum of all the numbers that can be formed with the digits 1, 2, 3, 4, 5 taken 4 at a time.