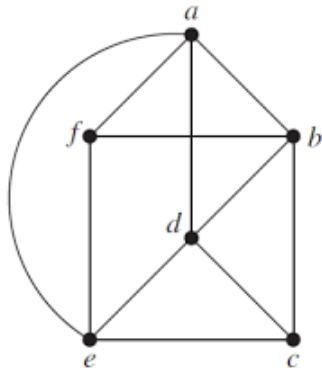
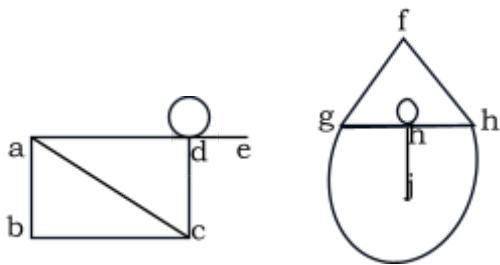


## IMPORTANT QUESTIONS FOR MID 2- DM

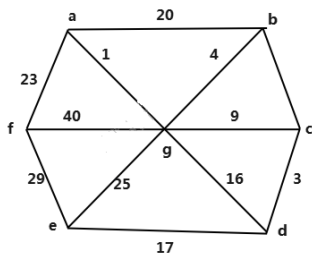
1. Define Distributive Lattice, Complemented Lattice and Boolean Algebra with examples.
2. Verify that  $(S_n, D)$  is a Boolean Algebra or not for  $n=24, n=36, n=45$ .
3. Define Semi Group, Monoid, Group and Abelian Group. give examples.
4. Show That the set  $G = \{0, 1, 2, 3, 4, 5, 6\}$  is an Abelian group with respect to Addition modulo 7.
5. Show That the set  $G = \{1, 2, 3, 4, 5, 6\}$  is an Abelian group with respect to multiplication modulo 7.
6. Find the number of 3 digit even numbers with no repeated digits.
7. Prove that for all integers  $n, r \geq 0$  if  $n+1 > r$  then  
$$P(n+1, r) = ((n+1)/(n+1-r))P(n, r).$$
8. Find the number of 5-digit positive integers such that in each of them every digit is greater than the digit to the right.
9. How many positive numbers  $n$  can we form using the digits 3, 4, 4, 5, 5, 6, 7 if we want  $n$  to exceed 5,000,000?
10. Find the term which contains  $x^{11}$  and  $y^4$  in the expansion of  $(2x^3 - 3xy^2 + z^2)^6$ .
11. Determine the coefficient of (a).  $xyz^2$  in the expansion of  $(2x - y - z)^4$  and (b).  $a^3b^4c^4d^5$  in the expansion of  $(a + 2b - 3c + 9d + 5)^{16}$ .
12. Survey of 500 television viewers of a sports channel produced the following information. 285 watch cricket, 195 watch hockey, 115 watch football, 45 watch cricket and football, 70 watch cricket and hockey, 50 watch hockey and foot ball and 50 do not watch any of these games.
  - (a) How many viewers in the survey watch all these kinds of games?
  - (b) How many viewers watch exactly one of these games.
13. 30 cars are assembled into a factory. The options available are a music system, an air conditioner and power windows. It is known that 15 of the cars have music systems, 8 have air conditioners and 6 have power windows. Further 3 have all options. Determine atleast how many cars do not have any option at all.
14. Define Cycle graph  $C_n$ , Wheel Graph,  $W_n$ , Complete Graph, Bipartite Graph and Complete Bipartite Graph and Draw  $C_5$ ,  $W_5$ ,  $K_5$ ,  $K_6$ ,  $K_{3,5}$  and  $K_{3,3}$ .
15. State and Prove Euler's formula.
16. Draw an undirected graph represented by the given adjacency matrix  
$$\begin{bmatrix} 1 & 2 & 2 & 0 & 0 & 1 & 3 & 0 & 0 & 3 & 1 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$
17. Determine whether the following graph have Euler circuit or Euler path, then construct the circuit or path if exists.



18. Show that the following graphs are Isomorphic.



19. Explain Kruskal's algorithm and find a minimal spanning tree of graph.



20. Define Chromatic number and find the chromatic number of  $K_5$ ,  $K_{3,4}$ ,  $W_5$  and  $C_5$ .