

Q. No.	Questions	M	CO	BL
-2.a	A copying company has eight photocopying machines and seven employees who can operate them. There are four copying jobs to be done. How many ways are there to allocate these jobs to operators and machines? Give detail answer.	5	3	3
2.b	How many different words of five letters can you make from the letters of the word REPUBLICAN, if every word must contain two different vowels and three different consonants? Give detail answer.	5	3	3
3.	Use generating function to solve the recurrence relation $a_k = 5a_{k-1} - 6a_{k-2}$ with initial conditions $a_0 = 6$ and $a_1 = 30$.	10	3	5
4.	Let (L, \leq) be the poset, where $L = \{1, 2, 3, 6, 12\}$ and the relation " \leq " means "divides". (i). Draw the Hasse diagram for the poset (L, \leq) (ii). Find the least upper bound and greatest lower bound tables for every two elements of the poset (L, \leq) . Hence, prove that the poset (L, \leq) is lattice.	10	4	2
5.	Let B be the set of all positive integer divisors of 15, that is, $B = \{1, 3, 5, 15\}$. Prove that B forms a Boolean algebra with zero element 1 and unity element 15, provided the operations are defined as follows: (i). $x + y$ is the least common multiple of x and y , (ii). $x \times y$ is the greatest common divisor, and (iii). x' is the ordinary arithmetical quotient $\frac{15}{x}$.	10	4	2
