BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

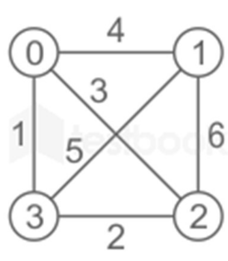
CLASS: BCA | **SEMESTER: II/ADD**
BRANCH: BCA | **SESSION: SP/2025**

SUBJECT: CN131 MATHEMATICS FOR COMPUTING I

TIME: 3 Hours | **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	i)Find the power set of the given set S = {a,{a},x}. ii)In a class of 100 students, 35 like science, 45 like maths, and 10 like both. How many like either of them, and how many like neither of them?	[2+3]	3,5	3,4
Q.1(b)	Prove that the given function f: Z→Z defined by f(x)=x-5 is one-to-one and onto.	[5]	4	4
Q.2(a)	Verify whether the given relation R={(1,1),(1,2),(2,1),(2,2),(3,3),(3,4),(4,3),(4,4)} defined on set A={1,2,3,4} is an equivalence relation or not.	[5]	4	4
Q.2(b)	i)Define Poset. ii)Draw the Hasse diagram by considering the partial order of divisibility on the set A={1,2,3,5,6,10,15,30}	[2+3]	1,5	1,3
Q.3(a)	i)Find how many diagonals there are in a 12-sided polygon. ii)Show that if any five numbers from 1 to 8 are chosen, then two of them will add to 9.	[2+3]	5,4	3,4
Q.3(b)	Find the order and degree of the given recurrence relation and solve it. $a_n = 4.a_{n-1} + 5.a_{n-2}$; $a_1 = 2$, $a_2 = 6$	[5]	4	4
Q.4(a)	i) Define an Eulerian graph and a Complete graph with an example. ii)Prove that a tree with n vertices has n- 1 edges.	[2+3]	1, 4	1, 4
Q.4(b)	Define the Spanning tree. Find the minimum weighted spanning tree for the following graph.	[2+3]	1,5	1,3



Q.5(a)	Prove that the set G={1,2,3,4,5,6} is a finite Abelian group of order 6 with respect to multiplication modulo 7.	[5]	4	4
Q.5(b)	Define Ring. Show that (Q, +,.) is a ring.	[2+3]	1,4	1,4

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