BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI (MID SEMESTER EXAMINATION MO/2024)

CLASS: BRANCH:

B. TECH. CSE/AIML SEMESTER : III/ADD

SESSION: MO/2024

SUBJECT: MAZOS DISCRETE MATHEMATICS

TIME:

02 Hours

FULL MARKS: 25

INSTRUCTIONS:

- 1. The question paper contains 5 questions each of 5 marks and total 25 marks.
- 2. Attempt all questions.
- 3. The missing data, if any, may be assumed suitably.
- 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

Q.1(a) Q.1(b)	Construct a truth table for the compound proposition $(p \lor q) \to (p \land q)$. Check whether $[(p \to q) \land (q \to r)] \to (p \to r) \equiv T$ or not.	[2] [3]	CO 1 1	BL 3 4
Q.2(a) Q.2(b)	If $p \to q$ is true, determine the truth value of $\neg p \land (p \to q)$. Show that the premises $p \to q$, $q \to r$, $\neg r$ lead to the conclusion $\neg p$.	[2] [3]	1	3
Q.3	Solve the recurrence relation $a_{n+2}-6a_{n+1}+9a_n=3(2^n)+7(3^n), n\geq 0$ given that $a_0=1$ and $a_1=4$.	[5]	2	4
Q.4	Use generating function to solve the recurrence relation $a_r=8a_{r-1}+10^{r-1}, r\geq 1$ with $a_0=1$.	[5]	2	4
2.0				

Q.5 Use Warshall's algorithm to find transitive closure of the relation $R=[5]\ 3$ 4 $\{(a,b),(b,a),(b,c),(c,d),(d,a)\}\ defined on the set <math>A=\{a,b,c,d\}.$

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