

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

CLASS: BCA
BRANCH: BCA

SEMESTER: III
SESSION : MO/2024

SUBJECT: CN207 MATHEMATICS FOR COMPUTING - II

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

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| | | CO | BL |
| Q.1(a) | What is a Tautology? | [2] | CO1 I |
| Q.1(b) | Construct the truth table for the following compound proposition and determine whether the given statement is a tautology, a contingency or an absurdity: $(p \Rightarrow q) \wedge (\sim p \Rightarrow r)$ | [3] | CO1 III |
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| Q.2(a) | Construct the truth table of the biconditional statement: $r \Leftrightarrow q$ | [2] | CO1 I |
| Q.2(b) | For the following conditional statement write its converse, contrapositive and inverse statements: <i>If you do not waste your study time then you will do well in the examination</i> | [3] | CO1 III |
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| Q.3(a) | Name and state any one rule of inference. | [2] | CO2 I |
| Q.3(b) | Check the validity of the following argument: <i>If I keep the pen on the table then I do not forget to bring the pen I forgot to bring the pen I lost the pen</i> <hr/> <i>Therefore, I did not keep the pen on the table and I lost the pen</i> | [3] | CO2 V |
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| Q.4(a) | Write negation of the following statement: <i>Mary lost her lamb or the wolf ate the lamb</i> | [2] | CO2 III |
| Q.4(b) | Prove the following result using mathematical induction. $1 + 2 + 2^2 + 2^3 + \dots + 2^n = 2^{n+1} - 1$ | [3] | CO2 V |
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| Q.5(a) | According to division algorithm, find the quotient and the remainder when dividend is -121 and divisor is 7. | [2] | CO3 III |
| Q.5(b) | Let a, b, c be integers, then prove that If $a \mid b$ and $a \mid c$, then $a \mid (2b+5c)$. | [3] | CO3 II |

:::23/09/2024:::E