

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

CLASS: IMSc
BRANCH: MATHS & COMPUTING

SEMESTER: III
SESSION: MO/2024

SUBJECT: MA201R1 PARTIAL DIFFERENTIAL EQUATIONS

TIME: 2 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The total marks of the questions are 25.
 2. Candidates attempt for all 25 marks.
 3. Before attempting the question paper, be sure that you have got the correct question paper.
 4. The missing data, if any, may be assumed suitably.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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| Q1 Derive the Partial differential equations by eliminating arbitrary functions from the following equation: $z = f(x^2 - y) + g(x^2 + y)$ | [5] | CO
CO-1 | BL
BT-2 |
| Q2 Solve the following linear Partial differential equation: $z(x + y)p + z(x - y)q = (x^2 + y^2)$ | [5] | CO-1 | BT-1 |
| Q3 Show that the following differential equations are compatible or not: $xp - yq = x$, $x^2p + q = xz$ | [5] | CO-2 | BT-1 |
| Q4 Find the complete integral of the following PDE:
$p(z + p) + q = 0$ | [5] | CO-2 | BT-1 |
| Q5 Solve the following linear Partial differential equations:
$(D^2 + DD' - 6D'^2)z = y \cos x + e^{x+y}$ | [2.5] | CO-2 | BT-1 |

:23/09/2024:E