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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

T-1, EXAMINATION- February-2020

B.Tech. I Semester (Backlog)

COURSE CODE: 10B11MA111 MAX. MARKS: 15

COURSE NAME: MATHEMATICS-I

COURSE CREDITS: 04 MAX. TIME: 1:00 Hrs.

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

Quest (1) If $z = e^{ax+by} f(ax - by)$, prove that **[CO-1] [3]**

$$b\frac{\partial z}{\partial x} + a\frac{\partial z}{\partial y} = 2abz.$$

Quest (2) By Changing the order of Integration , evaluate **[CO-1] [3]**

$$\int_0^{\infty} \int_x^{\infty} \frac{e^{-y}}{y}\, dy\, dx$$

Quest (3) Evaluate $curl(grad\ f)$, where $f = 16x\,y^3z^2$ **[CO-3] [3]**

Quest (4) Find the local extreme values of the function **[CO-2] [3]**

$$f(x, y) = 3y^2 - 2y^3 - 2x^2 + 6xy.$$

Quest (5)) Expand $f(x, y) = 2x^2 - xy + y^2 + 3x - 4y + 1$ in Taylor's series of maximum order about the point $(-1, 1)$. **[CO-2] [3]**