

As per New Syllabus
CBCS Pattern
of Shivaji University, Kolhapur

B.Sc. Part-I : Semester-II

HIGHER ORDER ORDINARY DIFFERENTIAL EQUATIONS AND PARTIAL DIFFERENTIAL EQUATIONS

(MATHEMATICS : DSC-6B : PAPER-IV)

Form a partial differential equation by eliminating a and b from $z = (x^2 + a)(y^2 + b)$ (1)

Solution : Consider, $z = (x^2 + a)(y^2 + b)$... (2)
Differential equation (1) partially, w.r.t. x and y , we get,

$$\frac{\partial z}{\partial x} = 2x(y^2 + b) \text{ and } \frac{\partial z}{\partial y} = (x^2 + a)2y$$

$$\text{Thus, } x^2 + a = \frac{1}{2y} \left(\frac{\partial z}{\partial y} \right) \text{ and } y^2 + b = \frac{1}{2x} \left(\frac{\partial z}{\partial x} \right)$$

Hence, the required partial differential equation is,

$$z = \frac{1}{4xy} \left(\frac{\partial z}{\partial x} \right) \left(\frac{\partial z}{\partial y} \right) \text{ or } pq = 4xyz$$

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**DSC-6B : HIGHER ORDER ORDINARY
DIFFERENTIAL EQUATIONS AND PARTIAL
DIFFERENTIAL EQUATIONS**

Paper - IV

For

B.Sc. Part - I : Semester - II

**According to New Syllabus (C.B.C.S. Pattern) of
Shivaji University, Kolhapur, w.e.f. June 2018**

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