Printing Page(s) : 1 **Paper Code :DSC-102**

Roll No. | | | | | | | | | | |

B.Sc. (PCM)-2, B.A. (Math)-2
1st Year Examination, Calendar Batch 2017
Mathematics-2 (Geometry & Calculus)

Time : 3 Hours] *[Max. Marks : 100*

***Note**. Attempt any **five** questions. Each questions carry equal marks.*

Q.1. Prove that the functions $1, x, x^2$ are linearly independent. Hence form the differential equation whose roots are $1, x, x^2$.

Q.2. Find the equation of the plane passing through the points (1,-1,2) and (2,-2,2) and which is perpendicular to the plane

$$6x - 2y + 2z = 9$$

Q.3. Find the projection of the line $3x - y + 2z - 1 = 0$, $x + 2y - z = 2$ on the plane $3x + 2y + z = 0$.

Q.4. Find the shortest distance between the lines

$$\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}; \frac{x-2}{3} = \frac{y-4}{4} = \frac{z-5}{5}$$

Q.5. Find the equation to the cone whose vertex is the point (a,b,c) and whose generating lines intersects the conic $px^2 + qy^2 = 1$, $z = 0$.

Q.6. Find the common area between the curve

$$y^2 = 4ax \text{ and } x^2 = 4ay.$$

Q.7. Evaluate $\log_{x \to \frac{\pi}{2}}(\sec x - \tan x)$.

Q.8. Find the whole length of the astrold

$$x^{\frac{2}{3}} + y^{\frac{2}{3}} = a^{\frac{2}{3}} \quad or$$

$$x = a\cos^3\theta, \qquad y = a\sin^3\theta.$$