Printing Page(s) : 1 **Paper Code :DSC-202**

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

B.Sc.(PCM)-10, B.A. (Math)-4
2nd Year Examination, Academic Batch 2016-17
Mathematics-V (Special Function an Mechanics)

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

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

Q.1 Prove that **[20]**

$$\int_{-1}^{1} x^2 P_{n+1} P_{n-1}\, dx = \frac{2n(n+1)}{(2n-1)(2n+1)(2n+3)}$$

Q.2 Solve **[20]**

$$\frac{d^2y}{yt^2} + y = 0$$

Under the condition that $y = 1, \frac{dy}{dx} = 0$

Q.3 If the radial and transverse velocities of a particle are always proportional to each other, show that the path is an equiangular spiral. **[20]**

Q.4 Prove that the acceleration of a point moving in a curve with uniform speed is **[20]**

$$e\left(\frac{dx}{dt}\right)^2$$

Q.5 Find the complete integral of 2zx-px2 – 2qxy+pq=0 **[20]**

Q.6 Show that fn(x) in even and odd function for even n and for odd n respectively. **[20]**

Q.7 Solve **[20]**

$$z^2\left(p^2 + q^2\right) = x^2 + y^2$$

Q.8 Find the laplace transform of the function $3\cos h5t - 4\sin h5t$ **[20]**