

Internal Examination 2021

DEPARTMENT OF MATHEMATICS

Internal Examination -SEMESTER-I

Course: MATH-H-GE-T-01

Course title: Differential Calculus

Answer the following questions.

$$5 \times 2 = 10$$

1. Find all the asymptotes of the curve

$$2x^3 - x^2y - 2xy^2 + y^3 - 4x^2 + 8xy - 4x + 1 = 0$$

2. If $y = \sin(m \sin^{-1} x)$, then using Leibnitz's theorem show that,

$$(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} + (m^2 - n^2)y_n = 0$$

Send answer sheet in the following mail id:

subhajit@nvc.ac.in

Internal Examination -Semester-I

Mathematics (General)-CC-T-01

Differential Calculus, F.M.-10

- (i) If $y = e^{a \sin^{-1} x}$, show that

$$(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} - (n^2 + a^2)y_n = 0.$$

Hence find $(y_n)_0$.

- (ii) If ρ and ρ_1 be the radii of curvature at the ends of two conjugate diameters of an ellipse, prove that

$$\rho^{\frac{2}{3}} + \rho_1^{\frac{2}{3}} = \frac{b^2 + a^2}{(ba)^{\frac{2}{3}}}.$$

[3+3+4]

Send answer sheet in the following mail id:

chinmay@nvc.ac.in
