

B.C.S. GOVT P.G. COLLEGE, DHAMTARI (C.G.)

ASSIGNMENT -2019-20

B.Sc. I Year (REGULAR)

MATHEMATICS

PAPER SECOND

(CALCULUS)

DATE:01-10-2020

M.M.: 50

Note: Answer any five questions. Each question carries equal marks.

1. a) Write Leibnitz's theorem (4 + 6=10)

b) If $\cos^{-1}\left(\frac{y}{b}\right) = \log\left(\frac{x}{n}\right)^n$, then prove that:

$$x^2 y_{n+2} + (2n + 1)x_{n+1} + 2n^2 y_n = 0$$

2. a) Write any four stapes of tracing of Cartesian curve. (4 + 6=10)

b) Trace the curve $y^2(a - x) = x^2(a + x)$.

3. a) Define improper Integral (4 + 6=10)

b) Find the value of improper Integral: $\int_s \frac{1}{x+s} \frac{1}{2x}$.

4. a) Define exact differential equation. (4 + 6=10)

b) Solve $x^2 \frac{d^2 y}{dx^2} - x \frac{dy}{dx} + y = 2 \log x$.

5. a) What is method of variation of parameter. (4 + 6=10)

b) Solve: $\frac{d^2 y}{dx^2} - 4x \frac{dy}{dx} + (4x^2 - 3)y = e^{x^2}$.

6. a) Trace the cardioid $r = a(1 + \cos \theta)$. (4 + 6=10)

b) Find its whole area of the cardioid $r = a(1 - \cos \theta)$