

JAGDISH NANDAN COLLEGE MADHUBANI

Department of Mathematics

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Home Assignment for winter vacation

B.Sc Part-II(H) (Session:-2022-2025)

Q.1. State and prove Leibnitz theorem.

Q.2. If $y^{\frac{1}{m}} + y^{-\frac{1}{m}} = 2x$, prove that

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

Q.3. State and prove Euler's theorem on homogenous function of three independent variables.

Q.4. Expand $\log (1 + \sin x)$, by Maclaurin's theorem as far as term involving x^4 .

Q.5. Evaluate the followings:-

(a) $\int \frac{dx}{4+5 \sin x}$

(b) $\int \frac{dx}{\sqrt{(x-\alpha)(\beta-x)}}$