

DEPARTMENT OF MATHEMATICS
BARASAT GOVERNMENT COLLEGE
SELF ASSESSMENT TEST-1 [SAT-1]
SEMESTER-II (GENERAL)- 2020

Subject: Mathematics
Course Code: MTMGCOR02T
DATE OF SAT-1: 18/04/2020

Maximum Marks: 25

Time: 1 Hr.

[Answer all questions]

1. Solve the IVP $(x^2 + 1)\frac{dy}{dx} + 4xy = x$, $y(2) = 1$. [5]
2. Given that $y = x + 1$ is a solution of $(x + 1)^2 \frac{d^2y}{dx^2} - 3(x + 1)\frac{dy}{dx} + 3y = 0$. Find the general solution. [5]
3. Solve by method of variation of parameters: $(D^2 + 4)y = \operatorname{cosec} 2x$, where $D \equiv \frac{d}{dx}$. [5]
4. Solve, $(x^2 D^2 - xD + 4)y = \cos(\log x) + x \sin(\log x)$, where $D \equiv \frac{d}{dx}$. [5]
5. Solve the PDE by Lagrange's Method: $px(x + y) - qy(x + y) + (x - y)(2x + 2y + z) = 0$. [5]

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