GOVERNMENT COLLEGE OF ENGINEERING, AMRAVATI
(An autonomous institute of Govt. of Maharashtra)

CT-1 [Direct-IInd year] W- 2015 **MARKS-15 TIME-1 HOUR**
SHU301,SHU303, SHU304 ENGG.MATHS-III [CIVIL/ MECH/ELPO/EXTC/CS/IT/IN]

Q.1 Using the method of variation of parameters Solve

$$\left(1+\frac{1}{e^x}\right)^2\left[\left(D^2-1\right)y\right]=1$$ **3**

Q.2 Solve $y=\log x\frac{\sin(\log x)+1}{x}-x^2\frac{d^2y}{dx^2}+3x\frac{dy}{dx}$. **3**

Q. 3 ATTEMPT ANY THREE **9**

(A) Solve $\left(D^3+1\right)y=\cos^2\left(\frac{x}{2}\right)+e^{-x}$

(B Solve $\frac{1}{e^x}\left(\frac{d^2y}{dx^2}-2\frac{dy}{dx}+2y\right)-\tan x=0$

(C) Solve the method of variation of parameter $\frac{d^2y}{dx^2}+y=\tan x$

(D) Solve $(1+x)^2\frac{d^2y}{dx^2}+(1+x)\frac{dy}{dx}+y=2\sin\log(1+x)$

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B. TECH II (CIVIL/MECH) **CT1** **Winter 2016** **Dt: 4/08/2016** **Time 1 Hour**

SHU301 Engineering Mathematics III

1. Find the elastic curve of a uniform cantilever beam of length l, having a constant weight w pound per foot by using the differential equation $EI\frac{d^2y}{dx^2} = \frac{w}{2}(l-x)^2$ under the conditions $\frac{dy}{dx} = y = 0$.
   Also determine the deflection of the free end. (4)

2. Solve the equation by method of variation of parameters
   $\frac{d^2y}{dx^2} - 4y = e^{2x}$. (2)

Que: ATTEMPT ANY THREE : (9)

3. Solve $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 4y = e^{2x} + x^3 + cos2x.$

4. Solve $(3x+2)^2\frac{d^2y}{dx^2} + 3(3x+2)\frac{dy}{dx} - 36y = 3x^2 + 4x + 1.$

5. Solve $x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = \sin(logx^2).$

6. Solve $\frac{d^3y}{dx^3} + 3\frac{dy}{dx} = cosh2x\ sinh3x.$