

M.Sc 1st Semester examination, 2018

Department of Mathematics, Mugberia Gangadhar Mahavidyalaya

(Ordinary Differential Equations and Special Functions)

Paper MTM – 103:: FULL MARKS : 10 :: Time : 25 Minutes

Internal Assessment for Sem-I

Answer any two questions 5*2=10

1. Discuss Frobenius method of finding the series solution about the regular singular point at the origin for an ODE of 2nd order when the roots of the indicial equation are unequal and not differ by an integer. 5

2. Find the Green Function for the boundary value problem 5

$$\frac{d^4 u}{dx^4} = 0 \quad \text{with} \quad u(0) = u'(0) = u(1) = u'(1) = 0$$

3. Prove that for the confluent hypergeometric function 5

$$G(\alpha, \beta, z) = \frac{\Gamma(\beta)}{\Gamma(\alpha)\Gamma(\beta - \alpha)} \int_0^1 t^{\alpha-1} (1-t)^{\beta-\alpha-1} e^{-zt} dt.$$

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