Mahavir Education Trust's

SHAH AND ANCHOR KUTCHHI ENGINEERING COLLEGE CHEMBUR, MUMBAI-88

Test-I

Sub: Applied Mathematics-II

FE (Sem-II) Date: 16/02/2015 Time: 12.00 – 1.00 Marks: 20

N.B.:- Figures to the right indicate full marks.

Q 1	Attempt any FIVE		10
	a	Solve $\frac{dy}{dx} = \frac{x-2y+5}{2x+y-1}$	
	b	Show that $(1+e^{x/y})\,dx + e^{x/y}(1-\frac{x}{y})\,dy = 0$ is an exact D.E.	
	c	Find the integrating factor of the differential equation $\left(x^4 e^x - 2mxy^2\right)dx + 2mx^2 y\,dy = 0$	
	d	Is the following differential equation exact? Justify $(x-2e^y)\,dy + (y + x\sin x)\,dx = 0$	
	e	Solve $\frac{dy}{dx} + 2y\tan x = \sin x$	
	f	Find the integrating factor of the differential equation $x^2 y dx - \left(x^3 + y^3\right)dy = 0$	
Q 2	Using Runge-Kutta 4th Order Method find the approximate value of y for $\frac{dy}{dx} = x + y^2$, $y(0) = 1$, at $x = 0.2$ in two steps (take h = 0.1) **OR** Use Euler's Modified Method to find the value of y up to 4 places of decimals for $\frac{dy}{dx} = x - y^2$, $y(0) = 1$, taking h = 0.2, for $x = 0.4$		05
Q 3	Evaluate $\int_0^1 \left(1 - \sqrt[5]{x}\right)^{3/2} dx$ **OR** Solve $\int_0^\infty \sqrt{x} e^{-\sqrt[3]{x}}\,dx$		05