(m)	MANIPAL ACADEMY of HIGHER EDUCATION
ALL MAN	(Damagins in Designation and a Series Control 1992, and 1998)

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DEPARTMENT OF SCIENCES, II SEMESTER M.Sc END SEMESTER EXAMINATIONS - 2019 PHY 4204: NUMERICAL METHODS AND COMPUTATIONAL PHYSICS (REVISED CREDIT SYSTEM)

Time:	3 Hours									Ν	/IAX. MARI	< S: 50
Answ 1 A 1 B	er all the qu Write a C p Find a real decimal acc	rogram root for curacy.	to mult the equ	tiply tw ation a	vo 3X3 x ³ – <i>x</i> /	matrice 2 – 5 =	es = 0 by f a	alse po	sition	meth	od with 3	5 M 5 M
2 A 2 B 2 C	Write a C program to simulate radioactive decay by Monte Carlo method Evaluate the integral from x=0 to x=1 for the following data by Trapezoidal method $\hline x 0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1$ $\hline y 10 10.61 11.24 11.89 12.56 13.25 13.96 14.69 15.44 16.21 17$ Given that $y' = x - y^2$ and y(0)=1. Using Taylor series for y(x), find y(0.1) correct to 4 decimal places									3 M 3 M 4 M		
3 A	Solve Poisson equation $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = -10(x^2 + y^2 + 10)$ in the following domain $\begin{array}{c} \begin{array}{c} 0 \\ 0 \\ 0 \end{array} \\ \begin{array}{c} 0 \\ 0 \end{array} \\ \end{array} \\ \begin{array}{c} 0 \\ \end{array} \\ \begin{array}{c} 0 \\ 0 \end{array} \\ \end{array} \\ \begin{array}{c} 0 \\ \end{array} \\ \end{array} \\ \begin{array}{c} 0 \\ 0 \end{array} \\ \end{array} \\ \end{array} $ \\ \begin{array}{c} 0 \\ 0 \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array}										5 M	
3 B	x 1 y 8.25	^d order 2 16.5 2	east squ 3 9.75	uare po 4 48 2	5 71.25	uial fit fo 6 99.5	or the fo 7 132.75	ollowin 8 171	lg data	9 4.25	10 262.5	5 M
4 A 4 B	Write a C program to perform interpolation using Lagrange's formula Obtain y(2.3) from the following set of data using Forward difference method x 1 2 3 4 5 6 7 x 3 8 144 406 902 171 2908 4574										3 M 4 M	
4 C	Solve the equation $2\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$ Given: $u(x, 0) = 4x - x^2$ u(0, t) = u(4, t) = 0										3 M	
5 A	A Solve the following set of equations using Gauss Jordon Me 2w+4x+y+2z=19 3w+3x+2y+ w+3x+2y+3z=22 4w+2x+3v+								nod =21 z=28			5 M
5 B	Write a C program to evaluate the series $sin^{-1}(x) = x + \left(\frac{1}{2}\right)\frac{x^3}{3} + \left(\frac{1}{2} \cdot \frac{3}{4}\right)\frac{x^5}{5} + \left(\frac{1}{2} \cdot \frac{3}{4} \cdot \frac{5}{6}\right)\frac{x^7}{7} + \cdots$										5 M	
