(4)   **Code No. : 04/201(B)**

OR

By the method of least square, find the straight line that best fits the following data :

x	1	2	3	4	5
y	14	27	40	55	68

Q.3   Using Picard's method to approximate y when   , given that   when   and   .

OR

Use Milne's method to find a solution of the differential equation   at   for the boundary condition   .

Q.4   Explain logical operator used in Fortran programming and discuss real expression.

OR

Explain Conditional statement and Integer expression in arithmetic operator.

---x---

Roll No......................   Total No. of Sections   : 03
                                         Total No. of Printed Pages : 04

Code No. : 04/201(B)

Fourth Semester Examination, May-2018

M.Sc. PHYSICS

Paper - II

COMPUTATIONAL METHODS AND PROGRAMMING

Time : 3 Hrs.   **Max.Marks : 80**

Note : Section 'A' consists of 10 very short answer type questions, all of which are compulsory and should be attempted first. Section 'B' consists of four short answer type questions with internal options. Section 'C' consists of four long answer type questions with internal choice.

$$\frac{dy}{dx} = x + y = 0$$

Section - 'A'

Answer the following very short-answer-type questions in one or two sentences :   **(2×10=20)**

Q.1   What do you mean by transcendental equation?

Q.2   Find the one root of the equation   .

Q.3   What is the simplest method of curve fitting and why?

Q.4   What is Trapezoidal rule?

Q.5   What do you mean by iteration?

Q.6   Define executable statement.

Q.7   What is Taylor series method?

Q.8   What do you mean by interpolation?

Q.9   Define eigen value and eigen vector of matrix.

Q.10   What is finite difference ? Write its types.

P.T.O.

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Section - 'B'

Answer the following short-answer-type questions with word limit 200-250 :　　　　**(5 4=20)**

Q.1　By using Newton Raphson method, find the roots of

　　　, which is nearer to 　, correct to three places of decimal.

OR

Find the inverse of

by Gauss Elimination method.

Q.2　Using Newton's formula for finite difference, find the value of the area of the circle of diameter 82m from the following :

d (diameter in m)	80	85	90	95	100
A (Area in m²)	5026	5674	6362	7088	7854

OR

What do you mean by curve fitting? Discuss one method of curve fitting with give example.

Q.3　Using Euler's method, find an approximate value of y

corresponding to 　, given that 　and 　where

　　.

(3)　　Code No. : 04/201(B)

OR

Discuss function of two or more variables with suitable examples.

Q.4　Explain arithmetic operators and flow chart with examples.

OR

Explain implementing loops in Fortran programming.

Section - 'C'

Answer the following long-answer-type questions with word limit 400-450 :　　　　**(10 4=40)**

Q.1　Using iteration method to solve the equation 　.

$$20x + y - 2z = 17$$
$$3x + 20y - z = -18$$
$$2x - 3y + 20z = 25$$

OR

Apply Gauss-Seidal iteration method to solve the equation.

Q.2　Use Newton's formula for interpolation to find the net premium at age 25 year from the table given below :

Age (year)	20	24	28	32
Annual net Premium (Rs.)	0.01427	0.01581	0.01772	0.01996

P.T.O.