.....B.E.Civil Engineering 2nd Year 1st Semester (Supplementary)[OLD]..... EXAMINATION, *2018*

SUBJECT ...*NUMERICAL ANALYSIS & COMPUTER PROGRAMMING* .....

PAPER .....

Time: **Three hours**

Full Marks 100
(50 marks for each part)

Use a separate Answer-Script for each part

No. of Questions	PART I	Marks
	Answer Q.1 and ANY FOUR questions from the rest	
1.a)	Write the equivalent FORTRAN statements of the following arithmetic equations i) $\theta = \cos^{-1}\left(\frac{a^2+b^2-c^2}{2ab}\right)$ ii) $z = \log_{10}\left(\sqrt{\lvert x-y\rvert}\right)$	[2+3+3+2=10]
1.b)	State whether the FORTRAN statements are correct or not. If not, rewrite the statement after rectifying them. i) `WRITE(5,15)A,BO` ii) `DIMENSION AB(6.0),C(5,5)` iii) `DO I=2,10`	
1.c)	Convert the following statement to 'Logical –IF' structure: `GO TO(7,17,27,37),KLMN`	
1.d)	Write examples of "Implied DO-Loop" statement and "Arithmetic IF" statement used in FORTRAN language.	
2.	Write a FORTRAN program to find the roots of the quadratic equation $ax^2+bx+c=0$. It should show the imaginary roots if it exists.	10
3.	Write a FORTRAN program to check whether the given integer is prime or not.	10
4.	Write a FORTRAN program that tabulates the values of the following function f(x,y) for the range of x and y as given below. $F(x,y) = x^2 + 5xy - y^2$ Range of x: 1.0 to 5.0 with the increment 0.5 Range of y: –2.0 to 4.0 with the increment 1.0	10

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No. of Questions	PART I	Marks
	(Contd. from page 1)	
5.	Write a FORTRAN programme that reads the elements of a matrix of size (4x6) row-wise and then interchanges the elements of 2nd row with that of 4th row and also interchanges the elements of 3rd column with that of 5th column and display the new matrix.	10
6.	Write a FORTRAN sub-programme to calculate the factorial of an integer. Using this subprogram, write a FORTRAN program to calculate ${}^nC_r$ using the following expression $${}^nC_r = \frac{n!}{r!(n-r)!}$$	10
7.	Write a FORTRAN sub-programme that calculates the following sum of products $a_1b_1 + a_2b_2 + a_3b_3 + \ldots a_nb_n$. Using this subprogram, write a FORTRAN program that calculates the following $$S = \frac{\sqrt{x_1^2 + x_2^2 + \ldots + x_n^2}\cdot\sqrt{y_1^2 + y_2^2 + \ldots + y_n^2}}{\sqrt{x_1y_1 + x_2y_2 + \ldots x_ny_n}}.$$	10

=== END ===

Form A: Paper –Setting Blank Ref No. –Ex/CE/T/215/2018(S) (OLD)

B.C.E. 2ND YEAR 1ST SEMESTER SUPPLY EXAM 2018(OLD)
(1st / ~~2nd~~-Semester ~~/ Repeat /~~-Supplementary ~~/ Annual / Biannual~~)

SUBJECT: *Numerical Analysis & Computer Programming*
(Name in full)

Time: ~~Two hours~~/Three hours/~~Four hours/ Six hours~~ Full Marks 100
(50 marks for each part)

Use a separate Answer-Script for each part

No. of Question	PART – II	Marks
	Answer **Q 1.** and **any three** from the rest.	
1.	Solve the following equation by *LU decomposition* method. x1+2x2+4x3-3x4 = 1 x1+x2+x3+x4 = 3 2x1-2x3+3x4 =4 x1-x2-x3+x4 = 1 Or, Solve the previous equations by *Gauss Elimination* method.	14
2.	Solve the following equation by *method of bisection*. Find out the result correct upto 3 decimal points. Use tabular form showing only one sample calculation. The root lies between (0 and 1). $\cos(x) = xe^x$	12
3.	Use *Newton Raphson method* of two variables to solve the equations $x=x^2+y^2$, $y=x^2-y^2$ Correct to two decimals, starting with the approximation (0.8, 0.4).	12
4.	The following table gives the viscosity of oil as a function of temperature. Use *Lagrange's formula* to find viscosity of oil at a temperature of 140^0.	

Temp (^{0})	110	130	160	190	200
Viscosity	10.8	8.1	5.5	4.8	4.5

12

5.	Using *Runge Kutta Method of order 4*, find y (0.2) given that dy/dx = 3x+0.5y, y (0) = 1. Take h=0.1.	12
6.	Write short notes :	
a)	Gauss Seidal Method	
b)	Inconsistent Equations	4+4+4= 12
c)	Non-linear Curve fitting	