

BACHELOR OF CIVIL ENGINEERING (EVENING) EXAMINATION 2018
(First Year, Second Semester)

SUBJECT : NUMERICAL ANALYSIS AND COMPUTER PROGRAMMING

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 Question No.1 and any Two from the rest.												
1.	Answer any one question											
	a) Write a computer program in FORTRAN 77 using False Position method that finds a root of the equation $x^2 + x - 2 = 0$ between 1.50 and 2.00, using tolerance of 0.001.	10										
	b) Write a FORTRAN 77 program to estimate a value y at a point x from a given table of values of x and y by using n th order Lagrange interpolation polynomial.	10										
2.	a) Using Newton-Raphson method, using two iterations, determine the roots of the following non-linear simultaneous equations, close approximation to start with $x = 1.00$ and $y = 1.00$ $x^3 - y^2 = -1$ $x^2 - 2x + y^3 = 2$	12										
	b) Solve the following system of equations by simple Gauss elimination method. $2x - y + z = 9$ $x + 3y + 2z = -1$ $4x + 4y + z = 5$	8										
3.	a) What is an initial-value problem? How is it different from a boundary value problem?	3										
	b) State the formula of Euler's method. Illustrate its concept graphically.	4										
	c) Explain Predictor – Corrector method for solving initial-value problem for the type $\frac{dy}{dx} = f(x,y)$ with initial condition $y = y_i$ at $x = x_i$.	6										
	d) Using Runge-Kutta method of order four find y at $x = 0.50$ and 1.00 by solving $y' = y(x^2 - 1)$, $y(0) = 1.0$. Assume step size (h) = 0.50.	7										
4.	a) Explain the principle of Secant method. What is the difference between false position method and Secant method?	4										
	b) Using Newton-Raphson method, using two iterations, find a root of the function $f(x) = x^2 - 4x - 10 = 0$, in the vicinity of $x = 4.00$.	4										
	c) What is interpolation? Given a set of n+1 points, state the general form of nth degree Lagrange interpolation polynomial..	4										
	d) For the following table of values: <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td> <td>2.00</td> <td>3.00</td> <td>4.00</td> <td>5.00</td> </tr> <tr> <td>f(x)</td> <td>7.00</td> <td>26.00</td> <td>63.00</td> <td>124.00</td> </tr> </table> <p>find f(x) for $x = 3.5$ using Lagrange interpolation. What order of polynomial would you use in the above problem?</p>	x	2.00	3.00	4.00	5.00	f(x)	7.00	26.00	63.00	124.00	8
x	2.00	3.00	4.00	5.00								
f(x)	7.00	26.00	63.00	124.00								

B.CIVIL ENGG. (EVENING). 1st YEAR 2nd SEMESTER EXAM 2018
 (2nd Semester / Repeat / Supplementary / Annual / Bimual)

SUBJECT: NUMERICAL ANALYSIS AND COMPUTER PROGRAMMING (old)
 (Name in full)

Full Marks 1

Time: ~~Two hours~~/Three hours/~~Four hours~~/Six hours

(50 marks for each pa

Use a separate Answer-Script for each part

No. of Question	PART – II
1.(a)	Write the equivalent FORTRAN expression for the following arithmetic statement: $Y=c+d^k+e^{-x}$
(b)	Write the equivalent arithmetic expression for the following FORTRAN statement: $Y=a**b/c+d**e*f-h/p*r+q$
(c)	What will be the printed output, at the end of the following program segment? <pre> m=-478 a=66.5 b=-.22E-02 WRITE(*,8) m,a,b 8 FORMAT(2X,I8,F8.2,E10.2) END </pre>
(d)	What will be the value of the variable n, at the end of the following program segment? <pre> n=1.0 x=10.0 y=x**2 n=n+(y/x) WRITE(*,*)n END </pre>
(e)	What will be the value of the variable n, at the end of the following program segment? <pre> X=0 DO I=1,6,3 Do J=2,3 X=X+1.0 END DO END DO WRITE (*,*) X END </pre>
2.	Write short notes on <u>any four</u> of the following. <ol style="list-style-type: none"> Different block if –statement. Function subprogram and subroutine subprogram Rules to be followed in written DO-Loop. Library function in FORTRAN Rules of writing FORTRAN program in a file.

No. of question		
1)	3. Answer any two Questions.	15x2=30
1)	a) i) Write a FORTRAN program to print ascending order form given input as N number integer.	8
2)	ii) Write step-wise Algorithm and draw the flow chart to find big number from given three integer number.	7
2)	b) i) Write a FORTRAN program, to product of two Matrices [A] and [B], both of size (2x3) and (3X2) respectively and store the result in a separate matrix [C]. Implied do loop use for output matrices and format it.	7
2)	ii) Write a FORTRAN program to the sum of following series for the first N terms, using function subprogram. $Y=1+ 2/2! + 3/3! +.....$	8
2)	c) i) Write a FORTRAN program to find the value of ${}^n C_r$, using subroutine subprogram.	8
	ii) Write a FORTRAN program to find out roots of given a quadratic equation.	7