BACHELOR OF CIVIL ENGINEERING (EVENING) EXAMINATION 2019

(First Year, Second Semester)

SUBJECT: COMPUTER PROGRAMMING - I

Time: Three Hours | Full Marks 100 (50 marks for each part)

Use a separate Answer-Script for each part

No. of Question	PART – I	MARKS

1.(a)	What will be the printed output, at the end of the following program segment?
	`i= 12`
	`x=-12.2`
	`y= 2.44E-02`
	`WRITE(*,8) i,x,y`
	`8 FORMAT(2X,I8,2X,F8.2,2X,E12.4)`
	`END`
		2

(b)	What will be the value of the variable X, at the end of the following program segment?
	`X=1.0`
	`DO I=1,5`
	`Do J=2,3`
	`X=X+1.0`
	`END DO`
	`END DO`
	`WRITE (*,*) X`
	`END`
		2

(c)	Write the equivalent FORTRAN expression for the following arithmetic statement: $Y=1-\|X\| e^{-by}$	2
(d)	Write the equivalent arithmetic expression for the following FORTRAN statement: `Y=A*B/C*D`	2
2	Write step-wise Algorithm and draw the flow chart to find out roots of given a quadratic equation.	4
3.	Answer **any three** Questions. a) Library function in FORTRAN b) Use of CASE statement. c) Distinguish between function subprogram and subroutine subprogram d) Write short notes on different type of do-Loop & Rules to be followed in written do-Loop	3x2=6

No. of Question		
4.	Answer **any two** Questions.	16x2=32
a)	i) Write a FORTRAN program to the sum of following series for the first N terms, using function subprogram. $$y = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} \text{ ....}$$	8+8
	ii) Write a FORTRAN program to find number of days from given input as month and year.	
b)	i) Write a FORTRAN program, to product of two Matrices [A] and [B], both of size (2 x 3) and (3 x 2) respectively and store the result in a separate matrix [C]. Implied do loop use for output matrices and format it.	8+8
	ii) Given four-digit integer number, write a FORTRAN program to print it in reverse and also find sum of the digits	
c)	i) Write a FORTRAN program to find the value of ${}^{n}c_{r}$, using function subprogram.	8+8
	ii)Write a FORTRAN program to print ascending order form given input as N number integer	

Ref. No.: Ex/CE/5/T/105/47/2019

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No. of questions	Part II	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 Bi-section method that finds a root of the equation $x^3 - 4x^2 + 8 = 0$ between 1.25 and 3.00, 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 =2.00 and y = 1.00 $x^3 - y^3 = 19$ $x^2 + 2x - y^2 = 11$	12
	b) Solve the following system of equations by simple Gauss elimination method. $x + y + z = 4$ $2x - 3y - 2z = 15$ $x + 2y - z = -3$	8
3.	a) What are the basic two approaches used in estimating the solution of differential equations? How are they different?	3
	b) Describe how Taylor's theorem of expansion can be used to solve a differential equation.	3
	c) Why is Heun's method classified as one-step Predictor – Corrector method?	6
	d) Using Runge-Kutta method of order four find y at x = 0.25 and 0.50 by solving $\frac{dy}{dx} = x + y + xy$, y (0) = 1.0. Assume step size (h) = 0.25.	8
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 $f(x) = x^3 - 3x + 8 = 0$, in the vicinity of x = 2.00.	4
	c) Using false-position method, using two iterations, find a root of the equation $x^3 - 2x^2 - 5x + 8 = 0$, with the initial estimates of $x_1 = 1.00$ and $x_2 = 2.25$.	4
	d) For the following table of values:	8

x	1.0	2.00	3.00	4.00
f(x)	0.500	0.333	0.250	0.200

Find f(x) for x = 2.5 using Lagrange interpolation. What order of polynomial would you use in the above problem?