



KC-6183

B. E. - II (Sem. III) (ECC) Examination

November / December – 2012

Computational Methods Using ‘C’

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दशावलि निशानीवाणी विगतो उत्तरवडी पर अवश्य लभवी.
Fillup strictly the details of signs on your answer book.

Name of the Examination :
B. E. - 2 (SEM. 3) (ECC)

Name of the Subject :
COMPUTATIONAL METHODS USING ‘C’

Subject Code No. : 6 1 8 3 Section No. (1, 2,.....): NIL

Seat No. :
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Student's Signature

- (2) Attempt all question.
(3) Assume suitable data wherever necessary.
(4) For all ‘C’ language programs, describe clearly input data and output data.

1 (a) Answer the following : 10

- (1) Which methods are used for finding solution of non-linear equations?
(2) Write other name of false position method.
(3) Write importance of interpolation.
(4) What is the use of Lagrangian interpolation.
(5) Define numerical integration and write importance of numerical differentiation.

(b) (1) Explain backward difference. 5

(2) Write algorithm of divided difference table. 5

2 (a) Given that one root of the non-linear equation 7

$x^3 - 4x - 9 = 0$ lies between 2.625 and 2.75 find the root correct to four significant using bisection method.

(b) Write an algorithm of newton Raphson method. 8

OR

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[Contd...

- 2 (a) Given the table of value as 7

x	2.5	3.0	3.5	4.0	4.5
$y(x)$	9.75	12.45	15.70	19.52	23.75

Find $y(4.25)$.

- (b) Write an 'C' program of Newton raphson method. 8

- 3 (a) Derive the formula of numerical differentiation for function tabulated at equal interval. 8

- (b) Evaluate $\int_1^2 e^{-1/2^x} dx$ using four intervals using

Simpson's $\frac{1}{3}$ rd method.

OR

- 3 (a) Given the following table : 8

x	0.50	0.75	1.00	1.25	1.50
$y(x)$	0.13	0.42	1.00	1.95	2.35

Find $f'(0.75)$

- (b) Derive the formula for trapezoidal method 7

- 4 (a) Answer the following in brief : 8

- (1) What do you mean by ordinary differential equations ? Give examples
- (2) Compare the result obtained by Euler's methods.
- (3) Explain boundary value problem.
- (4) Compare Jacobi and Gauss-siedel methods to find the solutions of linear equations.

- (b) Explain Gauss Jordan method to solve simultaneous linear equations. 5

- (c) Use 4th order Runge Kutta method to solve following equation to find y in interval $0.8 \leq x \leq 0.9$ by taking $h = 0.025$. 7

- 5 (a) Write algorithm for LU decomposition method to solve simultaneous linear equations. 7
- (b) Solve the following system of equations 8
- $$10x_1 + 4x_2 - x_3 = 0$$
- $$4x_1 + 2x_2 + 3x_3 = 0$$
- $$-x_1 + 3x_2 + x_3 = 0$$
- For the largest Eigen value and its associated eigen vector using power method.

OR

- 5 (a) Solve the following system of equation using Gauss-Seidel method. 8
- $$5x_1 + 2x_2 + x_3 = 12$$
- $$x_1 + 4x_2 + 2x_3 = 15$$
- $$x_1 + 2x_2 + 5x_3 = 20$$
- (b) Explain Gauss-Jordan method to find solution of simultaneous linear equation. 7
- 6 (a) Derive expression for Runge Kutta 2nd order method. Also write algorithm. 8
- (b) Given $dy/dx = xy$ with $y(1) = 5$, find the solution in the interval $[1, 1.5]$ using step size $h = 0.1$ using modified Euler's method. 7

OR

- 6 (a) Write an algorithm of Runge Kutta 4th order also write 'C' program. 8
- (b) Given $dy/dx = xy$ with $y(1) = 5$, find the solution in the interval $[1, 1.5]$ using step size $h = 0.1$ using Runge Kutta 2nd order method. 7