BCA   2nd SEMESTER   EXAM. ,   2015
MATHEMATICS   CODE- 303202

Time: 3 hours   Full Marks: 60

Instructions:

   i.   The Marks are indicated in the right -hand margin.
  ii.   There are **SEVEN** questions in this paper.
 iii.   Attempts **FIVE** question in all.
 iv.   Question Nos. **1** and **2** are compulsory.

1. Choose the correct option (any six).   2*6=12

  (a) The rounded value of 57.275 to two decimal place is

      (I)   57.27   (II) 5'

      (III) 57.26   (IV) None of the above

  (b) A non-zero polynomial $f(x)$ of degree 3 has roots at x = 1, x = 2 and x = 3.

      Which of the following is true?

      (I) $f(0) + f(4) < 0$ (II) $f(0)f(4) > 0$

      (III) $f(0) + f(4) > 0$ (IV) None of the above

  (c) The function $f(x) = 1 + \cos x - 5x^2$ is an example of

      (I)   Polynomial   (II) Transcendental

      (III) Both (I) and (II)   (IV) None of the above

  (d) Newton-Raphson method is based on Taylor's series but

      (I) neglecting 3rd and heigher order derivatives

      (II) accepting up to 3rd order derivatives

      (III) accepting up to 4th order derivatives

      (IV) neglecting 2nd order and higher order derivatives

  (e) If $y_0, y_1, \ldots y_n$ denote a set of values of y, then Δy_0 is

      (I) $(E + 1) y_0$ (II) E y_0

      (III) $(E - 1) y_0$ (IV) none of the above

  (f) Simpson's $\frac{1}{3}rd$ rule requires the division of the entire into

      (I) odd number of sub-intervals of equal length

      (II) even number if sub-intervals of equal length

(III) odd or even numbers of sub-intervals of equal length

(IV) None of the above

(g) Back-substitution is used in

(I) Jacobi method

(II) Gauss elimination method

(III) Gauss-Jordan method

(IV) none of the above

(h) Convergence in the Gauss-Seidel method is _____ as fast as Gauss-Jacobi method

(I) same

(II) twice

(III) thrice

(IV) None of the above

(i) Lagrange polynomial of degree two passes

(I) one point

(II) two points

(III) three points

(IV) none of the above

(j) Error in Simpson's $\frac{3}{8}rd$ rule is _____ compare to Simpson's $\frac{1}{3}rd$ rule.

(I) small

(II) negligible

(III) zero

(IV) large

2. Answer any three of the following: 4*3=12

(a) State the principle used in Gauss-elimination method.

(b) Solve 　　　　　*x + 2y = 5*

　　　　　　　　　2x + y = 4

using Gauss-Jordan method.

(c) State Newton's algorithms for finding square root of *N.*

(d) If the matrix A is such that $A = \begin{pmatrix} 2 \\ -4 \\ 7 \end{pmatrix} \begin{pmatrix} 1 & 9 & 5 \end{pmatrix}$

then find det*(A).*

(e) Find Δ*sin x.*

Answer any three of the following: 12*3=36

3. Find the missing term of the table given below :

X :	1	2	3	4	5	6	7
Y :	2	4	8	--	32	64	128

4. The velocity V km/min of a motorbike that starts from rest is given below :

t :	2	4	6	8	10	12	14	16	18	20
V :	10	18	25	29	32	20	11	5	2	0

Find the approximate distance covered in twenty minutes using Simpson's $\frac{1}{3}rd$ rule.

5. Use Jacobi method to find the solution of the following set of linear equations :

$5x_1 - 2x_2 + 3x_3 = -1$

$-3x_1 + 9x_2 + x_3 = 2$

$2x_1 - x_2 - 7x_3 = 3$

6. Find $\Delta^n (e^{ax+b})$.

7. Describe Lagrange's interpolation formula. Consider the following X_i's :

i :	0	1	2
x_i :	1	3	-2

Find $L_0(x)$, $L_1(x)$ and $L_2(x)$

$$* \; * \; *$$