(AUTONOMOUS)

BSc & BCA DEGREE EXAMINATION MAY 2018
(Second Semester)

Common to Branches - INFORMATION TECHNOLOGY &
COMPUTER APPLICATIONS

<u>MATHEMATICS</u>

Time : Three Hours   Maximum : 75 Marks

<u>SECTION-A (20 Marks)</u>
Answer ALL questions
ALL questions carry EQUAL marks   (10x2-20)

Find the rank of A = $\begin{bmatrix} i & -2 & -i \\ 2 & -4 & -2 \\ -1 & 2 & 1 \end{bmatrix}$.

Find the eigen values for the matrix A - $\begin{matrix} 5 & 3 \\ 1 & 3 \end{matrix}$

3   Solve $(D^2 + 2D + 1) y = 0$.

4   Solve the equation $p + q = x + v$.

5   Write the procedure for the backward substitution.

6   What is the condition for the convergence of Gauss - Jacobi & Gauss - Seidel methods?

7   Write down the Newton's forward interpolation formula.

8   Expand $A^5 u_0 = 0$.

9   Write down the Newton's backward difference formula.

10   Write down the Simpson's one third rule.

<u>SECTION - B (25 Marks)</u>
Answer ALL Questions
ALL Questions Carry EQUAL Marks *(5 x 5 - 2 5)*

11 a Show that the following equations, $2x - y + z = 7$; $3x + y - 5z - 13$
      $x + y -f_z = 5$ are consistent and solv e them.
                                    OR
   b Find the rank of the matrix.

   $A - \begin{bmatrix} 1 & 1 & f \\ 1 & -1 & 5 \\ 2 & 3 & 0 \end{bmatrix}$

   12 a Solve q- xp + p².
                                    OR
   b   Solve $z^4q^2 - z^2p = 1$.

   13 a   Solve by Gauss - elimination method for the following equations
              $2x + y + 4z = 12$; $8x - 3y + 2z - 20$; $4x + 1 ly - z = 33$.
                                    OR
          Using Gauss - Seidel method, solve the following system of equations
          $8x - y + z - 18 = 0$; $x + y - 3z -t- 6 = 0$; $2x + 5y - 2z - 3 - 0$.

14 a The following data gives the melting point of an alloy of lead and zinc.
Where t is the temperature in dec - C and P is the percentage of lead in the alloy.

P:	40	50	60	70	80	90
t:	184	204	226	250	276	304

using Newton's interpolation formula, find the melting point of the alloy containing 84 percent of lead.

OR

b Construct Newton's forward interpolation polynomial for the following data:

x:	4	6	8	10
y:	1	3	8	16

Use it to find the value of y for x = 5.

15 a From the values in the table given below, find the value of Sec 31° using numerical differentiation.

0:	31	32	33	34
tan 0 :	0.6008	0.6249	0.6494	0.6745

OR

b Dividing the range into 10 equal parts, find the approximate value o-f

$\int_0^{7t} \sin x \, dx$ by Simpson's rule,

SECTION - C (30 Marks)
Answer any THREE Questions
ALL Questions Carry EQUAL Marks (3 x 10 = 30)

16 Find the eigen vectors of the following matrix A $=\begin{vmatrix} 1 & 3 \\ 5 & 1 \\ 8 & 1 & 1 \end{vmatrix}$.

17 Solve $(x^2 - yz)p (y^2 - zx)q = z^2 - xy$.

18 Solve, by Gauss - Jacobi method for the following equations,
$27x + 6y -z = 85$; $6x + 15y + 2z = 72$; $x y + 54z = 110$.

19 Using a polynomial of the third degree, complete the record given below of the export of a certain commodity during five years:

Year:	1917	1918	1919	1920	1921
Export (in tons) :	443	384	-	397	467

20 , Find the value of cos 1.74 using the values given in the table below[f]:

X:	i.70	1.74	1.78	1.82	1.86
SinX:	0.9916	0.9857	0.9781	0.9691	0.9584

Z-Z-Z