APPENDIXES
APPENDIX - I
( Program for calculating P(y) )

Dim arrn(50), arry(50), x(50), Y(50) As Integer
Dim aryz(300), arrz, Sumz1, Sumz2, Sumz As Double
Dim Ara(60), Arb(350), arProbx(300) As Double
Dim intn, inta, intb, intsz, intrz, intz As Integer

Private Sub cmdstart_Click()
    Call CallNzzero
    Call Py
End Sub

Private Sub Py()
    Dim inty, intj As Integer
    Dim ArPyr(20), arPyn(20) As Double
    Open "D:\DATA_Pyr.txt" For Output As #3
    intn = 2
    Print #3,
    Print #3,
    Print #3, Tab(5); " N "; " r "; " y "; " P(y) 
    Print #3,
    Print #3,
    SumEy = 0
    For intj = 1 To (arr(intn) - arr(intn))
        inty = arr(intn) + intj
        If intj <> (arr(intn) - arr(intn)) Then
            ArPyr(intj) = arr(intn) / (inty * (inty - 1))
            SumEy = SumEy + ((inty) * ArPyr(intj))
            Print " E(y) = "; Format$(SumEy, "0.0000")
        Else
            ArPyr(intj) = (arr(intn) / (arr(intn) - 1))
            SumEy = SumEy + ((inty) * ArPyr(intj))
            Print " E(y) = "; Format$(SumEy, "0.0000")
        End If
    End For
    Print #3, Tab(5); arr(intn); arr(intn); inty; Format$(ArPyr(intj), "0.0000")
Next intj

Close #3
Open "D:\DATA_Pyn.txt" For Output As #4
For intn = 1 To 2
arPyn(intn) = arr(intn) / (arn(intn) - 1)
Print #4, arPyn(intn)
Next intn
Close #4
End Sub
APPENDIX - II
(Program for calculating \( f_z \) & \( E(z) \))

Dim arr(50), arrr(50), x(50), Y(50) As Integer
Dim arz(300), arfz, Sumz1, Sumz2, Sumz As Double
Dim Ara(60), Arb(350), arProbx(300) As Double
Dim intn, inta, intb, intsz, intrz, intz As Integer

Private Sub cmdstart_Click()
Call CalProbzfznew()
End Sub

Private Sub CalProbzfznew()
Dim intrz As Double
Dim intz, intn As Integer
Dim p, pz, q, qz, r1, r2, m, rd As Double
Dim s1, s2, sn, sd As Double
Dim arfz(100) As Double
Open "D:\Probzfz.txt" For Output As #1
  Print #1, " a ", " b ", " z ", " f(z) 

  Print #1,
  "USE DIFFERENT FIXED VALUES OF inta, intb & intAdash 
  for calculating f(z) & E(z)"
inta = 6
intb = 2
intAdash = 40
For intz = 1 To intAdash
  p = ((inta) + intz - 2)
pz = Funfact(p)
qu = ((inta) + (intb) + intz - 1)
qz = Funfact(q)
  r1 = (inta - 1)
rn = Funfact(r1)
r2 = (inta + intb - 1)
rd = Funfact(r2)
intrz = rn / rd
s1 = (intAdash + inta - 1)
   sn = Funfact(s1)
s2 = (inta + intb + intAdash - 1)
   sd = Funfact(s2)
intsz = sn / sd
If intrz <> intsz Then
  arfz(intz) = ((intb) * pz) / (qz * (intrz - intsz))
End If
  Print #1, inta, intb, intz, Format$(arfz(intz), "0.000000")
  Sumz1 = Sumz1 + (intz * arfz(intz))
Next intz
Print "E(z) = ", Format$(Sumz1, "0.00000")
Close #1
End Sub
APPENDIX - III

(Program for calculating values of a, b and z by equating the values of P(y) & f_z)

Private Sub cmdstart_Click()
    Call CalNrzero
    Call Py
    Call probfzeqpy
End Sub

Private Sub probfzeqpy()
    Dim intrz As Double
    Dim intn, intn As Integer
    Dim p, pz, q, qz, r1, r2, rn, rd As Double
    Dim s1, s2, sn, sd As Double
    Dim arfz As Double
    Open "D:\Probz.txt" For Output As 
    intn = 2        ' By varying the values of intn and corresponding
        inequality for which Py = fz, the values of a, b, z
        can be calculated
    Print #1, " a ", " b ", " z ", " f(z) "
    Print #1,
    intAdash = 100
    For inta = 1 To 50
        For intb = 1 To 50
            For intz = 1 To intAdash
                p = ((inta) + intz - 2)
                pz = Funfact(p)
                q = ((inta) + (intb) + intz - 1)
                qz = Funfact(q)
                r1 = (inta - 1)
                rn = Funfact(r1)
                r2 = (inta + intb - 1)
                rd = Funfact(r2)
                intrz = rn / rd
                s1 = (intAdash + inta - 1)
                sn = Funfact(s1)
                s2 = (inta + intb + intAdash - 1)
                sd = Funfact(s2)
                intsz = sn / sd
                If intrz <> intsz Then
                    arfz = ((intb) * pz) / (qz * (intrz - intsz))
                    'probs for N=10 and r=4
                    If (arfz > 0.195) And (arfz < 0.201) Then
                        'If (arfz > 0.132) And (arfz < 0.134) Then

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'If (arfz > 0.0952) And (arfz < 0.0954) Then
'If (arfz > 0.0713) And (arfz < 0.0715) Then
'If (arfz > 0.0554) And (arfz < 0.0556) Then
'If (arfz > 0.043) And (arfz < 0.045) Then

'probs for N=20 and r = 7
'If (arfz > 0.124) And (arfz < 0.126) Then
'If (arfz > 0.0971) And (arfz < 0.0973) Then
'If (arfz > 0.0777) And (arfz < 0.0779) Then
'If (arfz > 0.0635) And (arfz < 0.0637) Then
'If (arfz > 0.052) And (arfz < 0.054) Then
'If (arfz > 0.0448) And (arfz < 0.045) Then
'If (arfz > 0.0384) And (arfz < 0.0386) Then
'If (arfz > 0.0332) And (arfz < 0.0334) Then
'If (arfz > 0.0291) And (arfz < 0.0293) Then
'If (arfz > 0.0256) And (arfz < 0.0258) Then
'If (arfz > 0.0228) And (arfz < 0.023) Then
'If (arfz > 0.0204) And (arfz < 0.0206) Then
'If (arfz > 0.3683) And (arfz < 0.3685) Then

Print #1, inta, intb, intz, Format$(arfz, "0.000000")
End If
End If

Next intz
Next intb
Next inta

Close #1
End Sub
APPENDIX - IV
(Program for calculating values of a & b)

Private Sub cmdstart_Click()
Call CalProbfz1
End Sub (Program for calculating values of a & b)

Private Sub CalProbfz1()
Print "Prog. to calculate values of a & b for N=20, r=7, z=5, y=10 and A=100"
Dim inta, intb As Integer
Dim p, pz, q, qz, r1, r2, mn, rd As Double
Dim s1, s2, sn, sd, arfz As Double
inta = 5
inta = 34 ' By varying the values of inta the pairs (a, b) can be calculated
' for which fz = 0.078

For intb = 1 To 45
inta1 = 100
p = ((inta) + intz - 2)
pz = Funfact(p)
q = ((inta) + (intb) + intz - 1)
qz = Funfact(q)
r1 = (inta - 1)mn = Funfact(r1)
r2 = (inta + intb - 1)
rd = Funfact(r2)
intrz = mn / rd
s1 = (inta1 + inta - 1)
sn = Funfact(s1)
s2 = (inta + intb + intA1 - 1)
sd = Funfact(s2)
ints = sn / sd
If intrz <> ints Then
arfz = ((intb) * pz) / (qz * (intrz - ints))
If arfz > 0.077 And arfz < 0.079 Then
Print inta; intb; intz; Format$(arfz, "0.000")
End If
End If
Next intb

End Sub
APPENDIX-V

( Program for calculating P(x) for different N & r and $P_r(N/r_0, N)$ )

Private Sub CalProbX()
Dim intx, intr, inty, intz, intj As Integer
Dim inta, A, b, C, D, E, Sum, sumpro, T, Sum1 As Double
Open "D:ProbX.txt" For Output As #7
Print #7,
For intr = 10 To 100 Step 10  ' For calculating P(x) for odd N change running index
    From 25 to 100
        Print #7, " N = "; intr

        For intx = 2 To (intr - 1)
            For inty = 1 To intr

                If intx <= intr Then
                    arProbX(intx) = intr / (intr * (intr - 1))
                    GoTo D
                Else
                    If intx <= (intr - 1) Then
                        inta = intr / (intr * (intr - 1))
                        Sum = 0

                        For inty = (intr + 1) To intx
                            A = Funfact(intx - 1)
                            b = (inty - 1) * Funfact(intx - inty)
                            C = Funfact(intn - inty)
                            D = Funfact(intn - 2)
                            E = (A * C) / (b * D)
                            Sum = Sum + E
                        Next inty
                        arProbX(intx) = inta * (1 + Sum)
                        Print #7, " intx = "; intx, ", " Prob of X = "; Format$(arProbX(intx), "0.000000")
                    Next inty
                    GoTo b
                Else
                    Sum1 = 0
                    For intz = 0 To (intr - intr - 1)
                        T = 1 / (intr + intz)
                End If
            Next inty
        Next intr
End Sub
Sum1 = Sum1 + T
Next intz
    arProbx(intx) = (intr / intn) * Sum1
D:    Print #7, " intx =", intx, " Prob of X =", Format$(arProbx(intx), "0.000000")
    End If
End If
b:    Next intx
sumpro = 0
For intj = ((intn / 2) + 1) To (intn)
    sumpro = sumpro + arProbx(intj)
Next intj
Print #7, " for r = ", intr, " SUM of Prob(x >= n/2) = ", Format$(sumpro, "0.000000")
Print
Next intr
Next intn
Me.Print "Done"
Close #7

End Sub

Private Sub calEYr()
Dim intn, intr, intrz, k As Integer
Dim ra, numra, ST, FT, EyrM As Double

    For intn = 10 To 50 Step 10
        sumra = 0
        'intr = CInt(intn * 0.368)
        'intrz = intr
        If intn < 21 Then
            intrz = 2
        Else
            If intn < 41 Then
                intrz = 3
            Else
                intrz = 4
            End If
        End If
    End If
End If
APPENDIX - VI
(Program for calculating probability greater than median of median problem)

Private Sub cmdStart_Click()
Call CalNzrzero
Call CalProbx()
End Sub

Private Sub CalProbx()
Dim intx, intn, intr, inty, intz, intj As Integer
Dim inta, A, b, C, D, E, Sum, sumpro, T, Sum1 As Double
Open "D:\ProbX.txt" For Output As #7
Print #7,
For intn = 10 To 100 Step 10  ' For calculating P(x) for odd N change running index
  From 25 To 100
  Print #7, " N = ", intn
  For intr = 2 To (intn - 1)
    For intx = 1 To intn
      If intx <= intr Then
        arProbx(intx) = intr / (intn * (intn - 1))
      Else
        If intx <= (intn - 1) Then
          inta = intr / (intn * (intn - 1))
          Sum = 0
          For inty = (intr + 1) To intx
            A = Funfact(intx - 1)
            b = (inty - 1) * Funfact(intx - inty)
            C = Funfact(intn - inty)
            D = Funfact(intn - 2)
            E = (A * C) / (b * D)
            Sum = Sum + E
            arProbx(intx) = inta * (1 + Sum)
          Next inty
          GoTo b
        Else
          Sum1 = 0
          For intz = 0 To (intn - intr - 1)
T = 1 / (intr + intz)
Sum1 = Sum1 + T
Next intz.
arProbx(intx) = (intr / intn) * Sum1
End If
End If

b: Next intx
sumpro = 0
For intj = ((intn / 2) + 1) To (intn)
    sumpro = sumpro + arProbx(intj)
Next intj
Print #7, " for r = "; intr, "SUM of Prob(x >= n/2) = ", Format$(sumpro, "0.000000")
Print
Next intr
Next intn
Close #7

End Sub
APPENDIX - VII
( Program for calculating $E(Y)$ for original secretary problem & median problem)

Private Sub cmdstart_Click()
    Dim n As Integer
    Dim x As Double
    Call CalNrzero
    Call calEYr()
    End Sub

Private Sub calEYr()
    Dim intn, intr, intrz, k As Integer
    Dim ra, sumra, ST, FT, Eyrm As Double
    For intn = 10 To 50 Step 10
        sumra = 0
        'intr = CInt(intn * 0.368)
        'intrz = intr
        If intn < 21 Then
            intrz = 2
        Else
            If intn < 41 Then
                intrz = 3
            Else
                intrz = 4
            End If
        End If
    Next intn
    For k = 1 To (intn - intrz - 1)
        ra = 1 / (intrz + k)
        sumra = sumra + ra
    Next k
    ST = intrz * sumra
    FT = intrz + 1
    Eyrm = FT + ST
    Print intn, intrz
    Print
    Print "expected value of Y = ", Format$(Eyrm), "0.000000"
    Print
    Next intn
End Sub
APPENDIX VIII
(Please for calculating E(t))

Private Sub cmdstart_Click()
Dim n As Integer
Dim x As Double
Call CalEtA()
End Sub

Private Sub CalEtA()
Dim inta, intx, inti As Integer
Dim sumt, ptone, deno, Numu1, Numu2, term1, EtA As Double
sumt = 0
For inta = 25 To 60 Step 5
  intx = inta + 1
  ptone = 0.1 ^ intx
  deno = (1 - ptone)
  For inti = 1 To inta
    Numu1 = 0.1 ^ inti
    Numu2 = inti * Numu1
    sumt = sumt + Numu2
  Next inti
  Print inta, intx, ptone, deno
  Print
  Print inta, term1, "Expected value of T = ", Format$(EtA), "0.000000")
Next inta
End Sub