



GLOBAL JOURNAL OF SCIENCE FRONTIER RESEARCH
Volume 11 Issue 6 Version 1.0 September 2011
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN : 2249-4626 & Print ISSN:0975-5896

A New Summation Formula Allied With Hypergeometric Function

By Salahuddin

P.D.M College of Engineering , Bahadurgarh , Haryana , India

Abstract - The main objective of the present paper is to derive a summation formula of half argument associated to Bailey theorem .The result presented here is presumably new.

Keywords : *Gaussian Hypergeometric function , Contiguous function, Re - currence relation, Bailey summation theorem and Legendre duplication formula.*

GJSFR Classification: *2000 MSC No: 33C60 , 33C70.*



Strictly as per the compliance and regulations of:



A New Summation Formula Allied With Hypergeometric Function

Salahuddin

Abstract - The main objective of the present paper is to derive a summation formula of half argument associated to Bailey theorem. The result presented here is presumably new.

Keywords and Phrases : Gaussian Hypergeometric function , Contiguous function, Re-currence relation, Bailey summation theorem and Legendre duplication formula.

I. INTRODUCTION

Generalized Gaussian hypergeometric function of one variable is defined by

$${}_A F_B \left[\begin{matrix} a_1, a_2, \dots, a_A ; \\ b_1, b_2, \dots, b_B ; \end{matrix} z \right] = \sum_{k=0}^{\infty} \frac{(a_1)_k (a_2)_k \dots (a_A)_k z^k}{(b_1)_k (b_2)_k \dots (b_B)_k k!}$$

or

$${}_A F_B \left[\begin{matrix} (a_A) ; \\ (b_B) ; \end{matrix} z \right] \equiv {}_A F_B \left[\begin{matrix} (a_j)_{j=1}^A ; \\ (b_j)_{j=1}^B ; \end{matrix} z \right] = \sum_{k=0}^{\infty} \frac{((a_A))_k z^k}{((b_B))_k k!} \quad (1)$$

where the parameters $b_1, b_2, \dots, b_B$ are neither zero nor negative integers and A, B are non-negative integers.

Contiguous Relation is defined as follows [E. D. p.51(10), Andrews p.363(9.16), H.T. F. I p.103(32)]

$$(a-b) {}_2F_1 \left[\begin{matrix} a, b ; \\ c ; \end{matrix} z \right] = a {}_2F_1 \left[\begin{matrix} a+1, b ; \\ c ; \end{matrix} z \right] - b {}_2F_1 \left[\begin{matrix} a, b+1 ; \\ c ; \end{matrix} z \right] \quad (2)$$

Recurrence relation of gamma function is defined as follows

$$\Gamma(z+1) = z \Gamma(z) \quad (3)$$

Legendre duplication formula is defined as follows

$$\sqrt{\pi} \Gamma(2z) = 2^{(2z-1)} \Gamma(z) \Gamma\left(z + \frac{1}{2}\right) \quad (4)$$

$$\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi} = \frac{2^{(b-1)} \Gamma\left(\frac{b}{2}\right) \Gamma\left(\frac{b+1}{2}\right)}{\Gamma(b)} \quad (5)$$

$$= \frac{2^{(a-1)} \Gamma\left(\frac{a}{2}\right) \Gamma\left(\frac{a+1}{2}\right)}{\Gamma(a)} \quad (6)$$

Bailey summation theorem [Prud, p.491(7.3.7.8)] is defined as follows

$${}_2F_1 \left[\begin{matrix} a, 1-a ; \\ c ; \end{matrix} \frac{1}{2} \right] = \frac{\Gamma\left(\frac{c}{2}\right) \Gamma\left(\frac{c+1}{2}\right)}{\Gamma\left(\frac{c+a}{2}\right) \Gamma\left(\frac{c+1-a}{2}\right)} = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-1} \Gamma\left(\frac{c+a}{2}\right) \Gamma\left(\frac{c+1-a}{2}\right)} \quad (7)$$

II. MAIN RESULT OF SUMMATION FORMULA

$$\begin{aligned}
{}_2F_1 \left[\begin{matrix} a & , & -a-35 & ; & 1 \\ c & & & ; & 2 \end{matrix} \right] &= \frac{\sqrt{\pi} \Gamma(c)}{2^{c+35}} \times \left[\frac{4(415017197290314178560000)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \right. \\
&+ \frac{4(-701134724741952836966400a + 346312606003048571708160a^2 - 63044905774814277068160a^3)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(2520162030955804023312a^4 + 347909921081488886400a^5 - 17050603760335860120a^6)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(-1215731406744910440a^7 + 22493679752250729a^8 + 2293529179788000a^9 + 21722140394460a^{10})}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(-1179007608240a^{11} - 30913573194a^{12} - 149940000a^{13} + 3136500a^{14} + 42840a^{15} + 153a^{16})}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(995391244148036404838400c - 1188738087797910855260160ac + 433443627220853784109824a^2c)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(-54690068587015435432320a^3c + 222494190743852311824a^4c + 308870212868652946560a^5c)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(-2605193255977346328a^6c - 811390918393061160a^7c - 7344331962050919a^8c)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(809731932055200a^9c + 20301736826844a^{10}c - 49464547440a^{11}c - 6878340714a^{12}c - 76792800a^{13}c)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(-92940a^{14}c + 2520a^{15}c + 9a^{16}c + 940737212685399702896640c^2 - 842944939817358014300160ac^2)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(229804932215451704039424a^2c^2 - 19087576455710013350400a^3c^2 - 598038150920943774720a^4c^2)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(97496924379205317120a^5c^2 + 1795534443248012544a^6c^2 - 172218004133868000a^7c^2)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(-4900104145807200a^8c^2 + 63835461597600a^9c^2 + 3660595210272a^{10}c^2 + 32261090400a^{11}c^2)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(-301193760a^{12}c^2 - 5997600a^{13}c^2 - 24480a^{14}c^2 + 493113450686876996861952c^3)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(-340008605858413227294720ac^3 + 69119287604777891371008a^2c^3 - 3360401286427327654400a^3c^3)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(-259295274674166545920a^4c^3 + 14355397477659293440a^5c^3 + 651193244570304128a^6c^3)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
&+ \frac{4(-13393051014173600a^7c^3 - 809327950990240a^8c^3 - 4254392973600a^9c^3 + 232222999008a^{10}c^3)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} +
\end{aligned}$$

$$\begin{aligned}
& + \frac{4(3623373600a^{11}c^3 + 8336160a^{12}c^3 - 117600a^{13}c^3 - 480a^{14}c^3 + 165393111855973216813056c^4)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-88619859281749602508800ac^4 + 13234031762431394360320a^2c^4 - 267732463853898489600a^3c^4)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-50852045281263121280a^4c^4 + 885721501247352000a^5c^4 + 92742286806954400a^6c^4)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(188394608001600a^7c^4 - 58996252798560a^8c^4 - 853038648000a^9c^4 + 3592105440a^{10}c^4)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(131947200a^11c^4 + 628320a^12c^4 + 38348155565012206485504c^5 - 15980556939785111511040ac^5)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(1703747269799832083456a^2c^5 + 7094137991114845440a^3c^5 - 5780224308733390208a^4c^5)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-22987619341431360a^5c^5 + 6958079968315168a^6c^5 + 100932053893440a^7c^5 - 1873167815904a^8c^5)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-45925387200a^9c^5 - 162823584a^{10}c^5 + 1552320a^{11}c^5 + 7392a^{12}c^5 + 6441077978373336596480c^6)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-2075899486553471631360ac^6 + 150541710347476783104a^2c^6 + 4035388382214604800a^3c^6)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-406469269661199360a^4c^6 - 7894718282626560a^5c^6 + 279461650288128a^6c^6 + 7133593420800a^7c^6)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-4463585280a^8c^6 - 1055577600a^9c^6 - 6031872a^{10}c^6 + 807369926207525617664c^7)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-198998299950923038720ac^7 + 9013154655402692608a^2c^7 + 464897900224665600a^3c^7)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-17366159133649920a^4c^7 - 603327725468160a^5c^7 + 4491951518208a^6c^7 + 237685324800a^7c^7)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(1232056320a^8c^7 - 8870400a^9c^7 - 50688a^{10}c^7 + 76952353200486612992c^8)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-14260711716681830400ac^8 + 337711544275522560a^2c^8 + 30600618278630400a^3c^8)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-376535905025280a^4c^8 - 24535845734400a^5c^8 - 73578785280a^6c^8 + 3920716800a^7c^8)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(28005120a^8c^8 + 5637067161272188928c^9 - 766928822089830400ac^9 + 5176262833730560a^2c^9)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(1300268697728000a^3c^9 + 1160910150400a^4c^9 - 575089715200a^5c^9 - 4430666240a^6c^9)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} +
\end{aligned}$$

$$\begin{aligned}
& + \frac{4(25625600a^7c^9 + 183040a^8c^9 + 318647139652075520c^{10} - 30797759499386880ac^{10})}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-191736922144768a^2c^{10} + 36337203302400a^3c^{10} + 305641656320a^4c^{10} - 7318671360a^5c^{10})}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-69701632a^6c^{10} + 13865952926498816c^{11} - 909358510161920ac^{11} - 14383991078912a^2c^{11})}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(646743552000a^3c^{11} + 8097689600a^4c^{11} - 39137280a^5c^{11} - 372736a^6c^{11} + 460065647362048c^{12})}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-19154958950400ac^{12} - 430851133440a^2c^{12} + 6653337600a^3c^{12} + 95047680a^4c^{12})}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(11421693509632c^{13} - 272285081600ac^{13} - 7252725760a^2c^{13} + 30105600a^3c^{13} + 430080a^4c^{13})}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(205308559360c^{14} - 2339635200ac^{14} - 66846720a^2c^{14} + 2522349568c^{15} - 9175040ac^{15})}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4(-262144a^2c^{15} + 18939904c^{16} + 65536c^{17})}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-6110663484726998765568000a + 5999292753779459361024000a^2 - 1835414095881644284688640a^3}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{173306115070278868568448a^4 + 6847363087839492659280a^5 - 1277125239887448714064a^6}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-29403101847991115160a^7 + 3471963027381725856a^8 + 126277195151524725a^9}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-2216897933318673a^{10} - 171425296918260a^{11} - 2149251178156a^{12} + 31660673310a^{13}}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{1068483738a^{14} + 8985060a^{15} + 852a^{16} - 315a^{17} - a^{18} + 6110663485082686193664000c}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-16508266755118513166131200ac + 9924029599401067550100480a^2c}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-2045268821850893695203840a^3c + 97069461886560854657088a^4c + 11370086277363321580800a^5c}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-633824951895804745440a^6c - 41696927468297529120a^7c + 867582829527332292a^8c}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{81786749980320000a^9c + 738130579599600a^{10}c - 42829190268480a^{11}c - 1109263754088a^{12}c}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-5325868800a^{13}c + 113207760a^{14}c + 1542240a^{15}c + 5508a^{16}c + 10508974002562459395686400c^2}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} +
\end{aligned}$$

$$\begin{aligned}
& + \frac{-15912338427674300616560640ac^2 + 6627726370166439060112896a^2c^2}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-923720755083133693512960a^3c^2 + 8432672530427463216672a^4c^2 + 5300412627789403850880a^5c^2}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-58323559225558629744a^6c^2 - 14359766640878791440a^7c^2 - 117708974158778046a^8c^2}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{14649826634150400a^9c^2 + 361244419738488a^{10}c^2 - 955517381280a^{11}c^2 - 123959873268a^{12}c^2}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-1380153600a^{13}c^2 - 1664280a^{14}c^2 + 45360a^{15}c^2 + 162a^{16}c^2 + 7823722925976479795773440c^3}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-8155904534327159641866240ac^3 + 2452519572753235312705536a^2c^3}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-222301377892875933388800a^3c^3 - 5989963989578329635840a^4c^3 + 1148054756503305530880a^5c^3}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{19344109390635085056a^6c^3 - 2070540243026640000a^7c^3 - 57385728514224000a^8c^3}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{786409798204800a^9c^3 + 43840425315456a^{10}c^3 + 383966352000a^{11}c^3 - 3629404800a^{12}c^3}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-71971200a^{13}c^3 - 293760a^{14}c^3 + 3400140872524649384116224c^4 - 2609068981199287139205120ac^4}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{572280147968391303917568a^2c^4 - 30389538700606098585600a^3c^4 - 2162804762047330894080a^4c^4}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{129800158011581904000a^5c^4 + 5652662058893572800a^6c^4 - 123530509599789600a^7c^4}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-7227575616428640a^8c^4 - 36913079095200a^9c^4 + 2094884247456a^{10}c^4 + 32563792800a^{11}c^4}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{74803680a^{12}c^4 - 1058400a^{13}c^4 - 4320a^{14}c^4 + 976353339464085078540288c^5}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-566616560808405897216000ac^5 + 89945371865302855372800a^2c^5 - 2065831359960639237120a^3c^5}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{-351591072886247394816a^4c^5 + 6655650171513235200a^5c^5 + 657666695443443840a^6c^5}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{1100553967054080a^7c^5 - 424605744275328a^8c^5 - 6103877472000a^9c^5 + 26080306560a^{10}c^5}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} + \\
& + \frac{950019840a^{11}c^5 + 4523904a^{12}c^5 + 198112157533999839838208c^6 - 87792282223271875952640ac^6}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+36}{2})} +
\end{aligned}$$



$$\begin{aligned}
& + \frac{9845815694276704106496a^2c^6 + 23495206427488857600a^3c^6 - 33951590707313368320a^4c^6}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{-112788683080698240a^5c^6 + 41558256232312512a^6c^6 + 595618580430720a^7c^6 - 11290688684352a^8c^6}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{-275179766400a^9c^6 - 974812608a^{10}c^6 + 9313920a^{11}c^6 + 44352a^{12}c^6 + 29589228584336306995200c^7}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{-10006928347290172784640ac^7 + 757910734442793271296a^2c^7 + 19302863566552473600a^3c^7}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{-2072186286738923520a^4c^7 - 39427376325765120a^5c^7 + 1440727996409856a^6c^7}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{36498857472000a^7c^7 - 24299827200a^8c^7 - 5428684800a^9c^7 - 31021056a^{10}c^7}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{3338242567056453009408c^8 - 854705277266778685440ac^8 + 40269792261059260416a^2c^8}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{2022273891437184000a^3c^8 - 78204798453196800a^4c^8 - 2683947042120960a^5c^8 + 20452779502848a^6c^8}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{1068200179200a^7c^8 + 5534369280a^8c^8 - 39916800a^9c^8 - 228096a^{10}c^8 + 289112052804832198656c^9}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{-55212638992422912000ac^9 + 1361953471309516800a^2c^9 + 120228388600320000a^3c^9}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{-1524394295424000a^4c^9 - 97704262656000a^5c^9 - 290133043200a^6c^9 + 15682867200a^7c^9}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{112020480a^8c^9 + 19391941584781049856c^{10} - 2701252922655006720ac^{10} + 19575184610961408a^2c^{10}}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{4638318400235520a^3c^{10} + 3645345639936a^4c^{10} - 2067739914240a^5c^{10} - 15925797888a^6c^{10}}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{92252160a^7c^{10} + 658944a^8c^{10} + 1010033600684359680c^{11} - 99417087242403840ac^{11}}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{-596583567949824a^2c^{11} + 118442715955200a^3c^{11} + 993438351360a^4c^{11} - 23952015360a^5c^{11}}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{-228114432a^6c^{11} + 40711783303872512c^{12} - 2706854827622400ac^{12} - 42586761584640a^2c^{12}}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{1937882419200a^3c^{12} + 24259522560a^4c^{12} - 117411840a^5c^{12} - 1118208a^6c^{12} + 1256826574209024c^{13}}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} + \\
& + \frac{-52847972352000ac^{13} - 1187511091200a^2c^{13} + 18424627200a^3c^{13} + 263208960a^4c^{13}}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a+36}{2}\right)} +
\end{aligned}$$

$$\begin{aligned}
 & + \frac{29143244734464c^{14} - 699335884800ac^{14} - 18626273280a^2c^{14} + 77414400a^3c^{14} + 1105920a^4c^{14}}{\Gamma\left(\frac{c-a+1}{2}\right)\Gamma\left(\frac{c+a+36}{2}\right)} + \\
 & + \frac{490922311680c^{15} - 5615124480ac^{15} - 160432128a^2c^{15} + 5668601856c^{16} - 20643840ac^{16}}{\Gamma\left(\frac{c-a+1}{2}\right)\Gamma\left(\frac{c+a+36}{2}\right)} + \\
 & + \frac{-589824a^2c^{16} + 40108032c^{17} + 131072c^{18}}{\Gamma\left(\frac{c-a+1}{2}\right)\Gamma\left(\frac{c+a+36}{2}\right)} \Big] \quad (8)
 \end{aligned}$$

Derivation of result (8):

putting $b = -a - 35$, $z = \frac{1}{2}$ in known result (2), we get

$$\begin{aligned}
 & (2a + 35) {}_2F_1 \left[\begin{matrix} a, & -a - 35 \\ c & \end{matrix} ; \frac{1}{2} \right] \\
 & = a {}_2F_1 \left[\begin{matrix} a + 1, & -a - 35 \\ c & \end{matrix} ; \frac{1}{2} \right] + (a + 35) {}_2F_1 \left[\begin{matrix} a, & -a - 34 \\ c & \end{matrix} ; \frac{1}{2} \right]
 \end{aligned}$$

Now involving Bailey theorem, we get

$$\begin{aligned}
 \text{L.H.S} & = a \frac{\sqrt{\pi} \Gamma(c)}{2^{c+34}} \times \left[\frac{-52105549254577201152000 + 32287323345849598924800a}{\Gamma\left(\frac{c+a+35}{2}\right)\Gamma\left(\frac{c-a}{2}\right)} + \right. \\
 & \frac{46653140804973773057280a^2 - 32233367555303050334592a^3 + 5488847144083484177904a^4}{\Gamma\left(\frac{c+a+35}{2}\right)\Gamma\left(\frac{c-a}{2}\right)} + \\
 & \frac{-54214188346631854864a^5 - 36652142002941599400a^6 + 150767267386517376a^7}{\Gamma\left(\frac{c+a+35}{2}\right)\Gamma\left(\frac{c-a}{2}\right)} + \\
 & \frac{107897200878606183a^8 + 1994945981790927a^9 - 88817701723740a^{10} - 3580089931276a^{11}}{\Gamma\left(\frac{c+a+35}{2}\right)\Gamma\left(\frac{c-a}{2}\right)} + \\
 & \frac{-26449725078a^{12} + 660294138a^{13} + 13846860a^{14} + 81492a^{15} - 9a^{16} - a^{17}}{\Gamma\left(\frac{c+a+35}{2}\right)\Gamma\left(\frac{c-a}{2}\right)} + \\
 & \frac{-69462745690104564940800c - 70551909979177708154880ac + 130073489024108901355008a^2c}{\Gamma\left(\frac{c+a+35}{2}\right)\Gamma\left(\frac{c-a}{2}\right)} + \\
 & \frac{-44658168180463416436992a^3c + 4094833228285214588448a^4c + 167923996196793338880a^5c}{\Gamma\left(\frac{c+a+35}{2}\right)\Gamma\left(\frac{c-a}{2}\right)} + \\
 & \frac{-23094422267494862256a^6c - 724759463408214960a^7c + 37308814013226162a^8c}{\Gamma\left(\frac{c+a+35}{2}\right)\Gamma\left(\frac{c-a}{2}\right)} + \\
 & \frac{1755542571140160a^9c + 2970742369848a^{10}c - 923367713184a^{11}c - 16387628628a^{12}c}{\Gamma\left(\frac{c+a+35}{2}\right)\Gamma\left(\frac{c-a}{2}\right)} + \\
 & \left. \frac{-44372160a^{13}c + 1185000a^{14}c + 9936a^{15}c + 18a^{16}c + 11388523676642067087360c^2}{\Gamma\left(\frac{c+a+35}{2}\right)\Gamma\left(\frac{c-a}{2}\right)} \right]
 \end{aligned}$$

$$\begin{aligned}
& + \frac{-155921903756648262623232ac^2 + 112318874429912316822528a^2c^2 - 23342463632776772242176a^3c^2}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{948734345567285867520a^4c^2 + 115372423132311768192a^5c^2 - 4022722642181044032a^6c^2}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-324387436581812208a^7c^2 + 834141495369600a^8c^2 + 336406309039680a^9c^2 + 5563247526144a^{10}c^2}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-34990935840a^{11}c^2 - 1631387520a^{12}c^2 - 12667200a^{13}c^2 - 8640a^{14}c^2 + 144a^{15}c^2}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{55442465016311593304064c^3 - 111068382282816419364864ac^3 + 48393399324811963375616a^2c^3}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-6287216055695980984320a^3c^3 + 11555176589730762240a^4c^3 + 28950333169561579776a^5c^3}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{43930305906512256a^6c^3 - 51101370444273600a^7c^3 - 876496444556480a^8c^3 + 20374584310080a^9c^3}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{670195665216a^{10}c^3 + 3981539520a^{11}c^3 - 39305280a^{12}c^3 - 463680a^{13}c^3 - 960a^{14}c^3}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{37527463344249570066432c^4 - 42645015165231037800448ac^4 + 12397193443150168611840a^2c^4}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-965457019813117879040a^3c^4 - 32609399371332685440a^4c^4 + 3593283013890036544a^5c^4}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{91343821462370400a^6c^4 - 3395230689331360a^7c^4 - 121523975385120a^8c^4 - 212408787360a^9c^4}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{28154760480a^{10}c^4 + 301328160a^{11}c^4 + 433440a^{12}c^4 - 3360a^{13}c^4 + 13510118305163970347008c^5}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-10323758302057734266880ac^5 + 2056491071757425938432a^2c^5 - 82878606240028752384a^3c^5}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-6734959096606402816a^4c^5 + 219850789996252800a^5c^5 + 11976686903483456a^6c^5}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-41557606941312a^7c^5 - 6696675023808a^8c^5 - 68070119040a^9c^5 + 307699392a^{10}c^5 + 6120576a^{11}c^5}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{14784a^{12}c^5 + 3130056044504000102400c^6 - 1700270404273278939136ac^6}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{230786652805037564928a^2c^6 - 2689356571921800704a^3c^6 - 686916413160848640a^4c^6}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{2920295995931776a^5c^6 + 740064574884096a^6c^6 + 7029696406656a^7c^6 - 157484194560a^8c^6}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} +
\end{aligned}$$

$$\begin{aligned}
& + \frac{-2561623680a^9c^6 - 5854464a^{10}c^6 + 29568a^{11}c^6 + 504999310792104869888c^7}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-198785130849392001024ac^7 + 17819207207827030016a^2c^7 + 206447555264163840a^3c^7}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-41382372982579200a^4c^7 - 488097174039552a^5c^7 + 23698855842816a^6c^7 + 422140815360a^7c^7}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-551823360a^8c^7 - 34974720a^9c^7 - 101376a^{10}c^7 + 59161852372726185984c^8}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-1690038607025838080ac^8 + 937163970349009920a^2c^8 + 30707029480765440a^3c^8}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-1489251061267200a^4c^8 - 35818350720768a^5c^8 + 316518935040a^6c^8 + 9989168640a^7c^8}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{33834240a^8c^8 - 126720a^9c^8 + 5152744512277446656c^9 - 1056982167398277120ac^9}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{31698064973752320a^2c^9 + 1844571268700160a^3c^9 - 28075061414400a^4c^9 - 1155058544640a^5c^9}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-1891169280a^6c^9 + 101038080a^7c^9 + 366080a^8c^9 + 337670204648325120c^{10} - 48683180589801472ac^{10}}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{546819979689984a^2c^{10} + 65208351143936a^3c^{10} - 65191526400a^4c^{10} - 19405754368a^5c^{10}}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-98402304a^6c^{10} + 292864a^7c^{10} + 16698720466501632c^{11} - 1635615902269440ac^{11}}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{-3551832653824a^2c^{11} + 1420850995200a^3c^{11} + 8211374080a^4c^{11} - 154312704a^5c^{11} - 745472a^6c^{11}}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{619584954433536c^{12} - 39175823138816ac^{12} - 436475719680a^2c^{12} + 18239836160a^3c^{12}}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{150958080a^4c^{12} - 372736a^5c^{12} + 16973437272064c^{13} - 640631685120ac^{13} - 10411089920a^2c^{13}}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{118702080a^3c^{13} + 860160a^4c^{13} + 332921733120c^{14} - 6598082560ac^{14} - 116490240a^2c^{14}}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{245760a^3c^{14} + 4420796416c^{15} - 36175872ac^{15} - 524288a^2c^{15} + 35586048c^{16} - 65536ac^{16} + 131072c^{17}}{\Gamma(\frac{c+a+35}{2}) \Gamma(\frac{c-a}{2})} + \\
& + \frac{12449059983360000 - 383597871711526547712000a + 349847372475982144108800a^2}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} +
\end{aligned}$$

$$\begin{aligned}
& + \frac{-91897064286234680718720a^3 + 5349183000720094955952a^4 + 624669804151667381584a^5}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{-35315751928499458920a^6 - 2851177925475811680a^7 + 30576386460688299a^8}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{5649027499407633a^9 + 106277649831540a^{10} - 1707700340180a^{11} - 85722805854a^{12}}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{-1008568218a^{13} + 167580a^{14} + 89580a^{15} + 603a^{16} + a^{17} + 383597914530722217984000c}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{-984494237718394284134400ac + 533683276801989101360640a^2c - 88673539520059738539264a^3c}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{937411648798849628448a^4c + 602576665340697774720a^5c - 3095068771370511600a^6c}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{-1813741731860501520a^7c - 32446407661384398a^8c + 1545568399393920a^9c + 60904486614840a^{10}c}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{428069571552a^{11}c - 11769254868a^{12}c - 240186240a^{13}c - 1381080a^{14}c + 432a^{15}c + 18a^{16}c}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{634646928998497701888000c^2 - 891544960641224822353920ac^2 + 323497946519474767570944a^2c^2}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{-33039865708098194060544a^3c^2 - 1069107709209191124480a^4c^2 + 191538372418841669760a^5c^2}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{5047298563885611264a^6c^2 - 336320453706868752a^7c^2 - 14028936710025600a^8c^2}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{13044949325760a^9c^2 + 8229644260992a^{10}c^2 + 133856866080a^{11}c^2 + 220993920a^{12}c^2 - 11282880a^{13}c^2}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{-86400a^{14}c^2 - 144a^{15}c^2 + 449758803541459552174080c^3 - 424361084473430996287488ac^3}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{106699621776076144541696a^2c^3 - 5943566750811274905600a^3c^3 - 511600651806731988480a^4c^3}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{26180828185511231232a^5c^3 + 1593174370131501696a^6c^3 - 15025123090190400a^7c^3}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{-1913536321611200a^8c^3 - 25716298386240a^9c^3 + 304613660736a^{10}c^3 + 9607590720a^{11}c^3}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{64478400a^{12}c^3 - 20160a^{13}c^3 - 960a^{14}c^3 + 184187526298792576843776c^4}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} + \\
& + \frac{-124561329541509091192832ac^4 + 21709061172519601090560a^2c^4 - 431132806280069582080a^3c^4}{\Gamma\left(\frac{c+a+36}{2}\right) \Gamma\left(\frac{c-a-1}{2}\right)} +
\end{aligned}$$

$$\begin{aligned}
& + \frac{-101975664292724745600a^4c^4 + 1054283755518504896a^5c^4 + 206173676796780000a^6c^4}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{2226847463869600a^7c^4 - 108572981600160a^8c^4 - 2646472345440a^9c^4 - 9261917280a^{10}c^4}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{225573600a^{11}c^4 + 2005920a^{12}c^4 + 3360a^{13}c^4 + 49339504936023346905088c^5}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{-24507367998079394856960ac^5 + 2888874316719236392960a^2c^5 + 28254033881806182912a^3c^5}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{-11337146664891072256a^4c^5 - 141887361281339520a^5c^5 + 13500845824262720a^6c^5}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{327039780203136a^7c^5 - 1523026642368a^8c^5 - 105685050240a^9c^5 - 851484480a^{10}c^5 + 266112a^{11}c^5}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{14784a^{12}c^5 + 9243724230164377927680c^6 - 3392714026389984235520ac^6}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{256000715426159176704a^2c^6 + 9560726388764655104a^3c^6 - 745346714565277440a^4c^6}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{-22673639805013120a^5c^6 + 402088325683968a^6c^6 + 17963712945024a^7c^6 + 103427976960a^8c^6}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{-1653590400a^9c^6 - 17563392a^{10}c^6 - 29568a^{11}c^6 + 1260981912550139494400c^7}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{-340145536546911879168ac^7 + 14669030470350012416a^2c^7 + 1031175960548659200a^3c^7}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{-26915981666365440a^4c^7 - 1466661042975744a^5c^7 - 1392908504064a^6c^7 + 483138754560a^7c^7}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{4867737600a^8c^7 - 1520640a^9c^7 - 101376a^{10}c^7 + 128421640911359803392c^8}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{-25086382139421306880ac^8 + 461793624582343680a^2c^8 + 64904964334172160a^3c^8}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{-257288995434240a^4c^8 - 52460877756672a^5c^8 - 476345802240a^6c^8 + 5667340800a^7c^8}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{74891520a^8c^8 + 126720a^9c^8 + 9909451880787869696c^9 - 1367832022323486720ac^9}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{-554339253811200a^2c^9 + 2617395227166720a^3c^9 + 21121170470400a^4c^9 - 1046816010240a^5c^9}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{-14068454400a^6c^9 + 4392960a^7c^9 + 366080a^8c^9 + 583327157087600640c^{10} - 54833650369372160ac^{10}}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} +
\end{aligned}$$

$$\begin{aligned}
& + \frac{-799709448265728a^2c^{10} + 67865020647424a^3c^{10} + 1036668272640a^4c^{10} - 9819729920a^5c^{10}}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{-172204032a^6c^{10} - 292864a^7c^{10} + 26186417921064960c^{11} - 1586469855559680ac^{11}}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{-39937560592384a^2c^{11} + 1065864683520a^3c^{11} + 21495685120a^4c^{11} - 6709248a^5c^{11} - 745472a^6c^{11}}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{889333785919488c^{12} - 31864244199424ac^{12} - 1058624286720a^2c^{12} + 8328785920a^3c^{12}}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{218050560a^4c^{12} + 372736a^5c^{12} + 22449979654144c^{13} - 409953976320ac^{13} - 16542310400a^2c^{13}}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{5160960a^3c^{13} + 860160a^4c^{13} + 408015175680c^{14} - 2744729600ac^{14} - 143032320a^2c^{14} - 245760a^3c^{14}}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} + \\
& + \frac{5043650560c^{15} - 1572864ac^{15} - 524288a^2c^{15} + 37945344c^{16} + 65536ac^{16} + 131072c^{17}}{\Gamma(\frac{c+a+36}{2}) \Gamma(\frac{c-a-1}{2})} \Bigg] + \\
& + (a+35) \frac{\sqrt{\pi} \Gamma(c)}{2^{c+34}} \times \left[\frac{-179725396599156215808000a + 176278465478072598681600a^2}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \right. \\
& + \frac{-53998442915060528352000a^3 + 5212143058443128698752a^4 + 163094646060428607216a^5}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-34870989959766941120a^6 - 63109355519267400a^7 + 86522703948738904a^8}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{2692481789166367a^9 - 51357622524560a^{10} - 3216119281100a^{11} - 33810573664a^{12} + 474997418a^{13}}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{12624080a^{14} + 81500a^{15} + 8a^{16} - a^{17} + 179725396620079005696000c}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-480079894993878915993600ac + 286607538218612078876160a^2c - 58923681600767092598016a^3c}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{2936554833613340252448a^4c + 289401323546004593280a^5c - 17122889417978895600a^6c}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-960678744526651920a^7c + 21786918677930802a^8c + 1678621152574080a^9c + 12060050654520a^{10}c}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-730595054112a^{11}c - 15707443668a^{12}c - 59928960a^{13}c + 1038120a^{14}c + 9648a^{15}c + 18a^{16}c}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{303801429586540599705600c^2 - 453783256859086929100800ac^2 + 186831429964357434200064a^2c^2}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-25914595017961243846656a^3c^2 + 322902132293612363520a^4c^2 + 132690881259963290880a^5c^2}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} +
\end{aligned}$$

$$\begin{aligned}
& + \frac{-1755729792096314496a^6c^2 - 319627807778725248a^7c^2 - 1938186903906000a^8c^2}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{279199198531440a^9c^2 + 5844089982192a^{10}c^2 - 16398985680a^{11}c^2 - 1467565680a^{12}c^2}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-12531120a^{13}c^2 - 10800a^{14}c^2 + 144a^{15}c^2 + 221174161658527623413760c^3}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-226618912242782832033792ac^3 + 67036582057662381981696a^2c^3 - 6046549868935001753600a^3c^3}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-130812769244615790080a^4c^3 + 27665106534009564928a^5c^3 + 375525399579949696a^6c^3}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-43434993087041600a^7c^3 - 1030384714673600a^8c^3 + 13899929883840a^9c^3 + 623936233536a^{10}c^3}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{4417385280a^{11}c^3 - 33364800a^{12}c^3 - 450240a^{13}c^3 - 960a^{14}c^3 + 93499020907827110608896c^4}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-70187939957957661523968ac^4 + 15063413339614862888960a^2c^4 - 801025517520925777920a^3c^4}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-49095298146212102400a^4c^4 + 2980691863620575104a^5c^4 + 111731381007400000a^6c^4}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-2433965084610400a^7c^4 - 118394832346560a^8c^4 - 477481102560a^9c^4 + 24869718720a^{10}c^4}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{295864800a^{11}c^4 + 477120a^{12}c^4 - 3360a^{13}c^4 + 25966303486948763762688c^5}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-14657409272023175741440ac^5 + 2262698965968343705600a^2c^5 - 53980880947959178752a^3c^5}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-7653568354604736256a^4c^5 + 147484321071669120a^5c^5 + 12085862944232000a^6c^5}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{9530353117824a^7c^5 - 6071200056768a^8c^5 - 70813733760a^9c^5 + 241348800a^{10}c^5 + 5943168a^{11}c^5}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{14784a^{12}c^5 + 5063113354325031649280c^6 - 2167153902409193062400ac^6}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{234714970109273206784a^2c^6 + 72965393203383296a^3c^6 - 690673666259709440a^4c^6}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-1363969989536000a^5c^6 + 686661075881088a^6c^6 + 8198063803776a^7c^6 - 134697911040a^8c^6}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-2501452800a^9c^6 - 6179712a^{10}c^6 + 29568a^{11}c^6 + 721356330294449274880c^7}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} +
\end{aligned}$$

$$\begin{aligned}
& + \frac{-233641252827241971712ac^7 + 16956797879563452416a^2c^7 + 366636901242163200a^3c^7}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-38601213445386240a^4c^7 - 621398831133696a^5c^7 + 20731335668736a^6c^7 + 425308477440a^7c^7}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-241612800a^8c^7 - 33960960a^9c^7 - 101376a^{10}c^7 + 76967242257705992192c^8}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-18676816839483883520ac^8 + 836470098009722880a^2c^8 + 36299867555466240a^3c^8}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-1305758760176640a^4c^8 - 37509602473728a^5c^8 + 247552757760a^6c^8 + 9713932800a^7c^8}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{34974720a^8c^8 - 126720a^9c^8 + 6239553251386064896c^9 - 1114738046535393280ac^9}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{26007420905523200a^2c^9 + 1945362268129280a^3c^9 - 22331646937600a^4c^9 - 1141610229760a^5c^9}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-2588185600a^6c^9 + 98109440a^7c^9 + 366080a^8c^9 + 386834950982205440c^{10} - 49581031165952000ac^{10}}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{350996352458752a^2c^{10} + 65277038002176a^3c^{10} + 30350960640a^4c^{10} - 18809190400a^5c^{10}}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-100452352a^6c^{10} + 292864a^7c^{10} + 18329372050063360c^{11} - 1624283296563200ac^{11}}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{-7763585449984a^2c^{11} + 1386477281280a^3c^{11} + 8971755520a^4c^{11} - 149839872a^5c^{11} - 745472a^6c^{11}}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{658306213347328c^{12} - 38248757886976ac^{12} - 490285752320a^2c^{12} + 17632276480a^3c^{12}}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{152821760a^4c^{12} - 372736a^5c^{12} + 17603540025344c^{13} - 619456839680ac^{13} - 10762035200a^2c^{13}}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{115261440a^3c^{13} + 860160a^4c^{13} + 339403079680c^{14} - 6364364800ac^{14} - 117227520a^2c^{14}}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{245760a^3c^{14} + 4456448000c^{15} - 35127296ac^{15} - 524288a^2c^{15} + 35651584c^{16} - 65536ac^{16}}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{131072c^{17}}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a+34}{2})} + \\
& + \frac{830034394580628357120000 - 1377065451088614086553600a + 650917761399667233123840a^2}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-106441825212269888974848a^3 + 1797340338149203219104a^4 + 775661574779850021264a^5}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} +
\end{aligned}$$

$$\begin{aligned}
& + \frac{-14952856152307795120a^6 - 2905674724521079336a^7 - 15241731062500822a^8}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4510465479373073a^9 + 119693002445720a^{10} - 757636334884a^{11} - 72635836868a^{12} - 1001843738a^{13}}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-1104440a^{14} + 80068a^{15} + 586a^{16} + a^{17} + 1990782488296072809676800c}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-2318612026053359499816960ac + 799293299722875962131968a^2c - 86397059455847148780288a^3c}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-2060870095990900419552a^4c + 585055100899622895360a^5c + 8575377898850894544a^6c}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-1505688369793705680a^7c - 43691973648968238a^8c + 962487629468640a^9c + 55486260156888a^{10}c}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{551069327424a^{11}c - 8772675828a^{12}c - 220815840a^{13}c - 1385400a^{14}c + 144a^{15}c + 18a^{16}c}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{1881474425370799405793280c^2 - 1632458853872025818923008ac^2 + 414369892955453180203008a^2c^2}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-26959982583521703297024a^3c^2 - 1940300862028789774080a^4c^2 + 154977103409202885888a^5c^2}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{7009302342933356928a^6c^2 - 224562920489457792a^7c^2 - 13797969990591600a^8c^2}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-61945879319280a^9c^2 + 6774945182544a^{10}c^2 + 130356127440a^{11}c^2 + 359874480a^{12}c^2}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-10088400a^{13}c^2 - 84240a^{14}c^2 - 144a^{15}c^2 + 986226901373753993723904c^3}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-653423370678042386006016ac^3 + 121223070338904522633216a^2c^3 - 3667640265557653038080a^3c^3}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-618211944332780994560a^4c^3 + 16410099785215273984a^5c^3 + 1646990973593760256a^6c^3}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-676053491748800a^7c^3 - 1669935333999680a^8c^3 - 28248215244480a^9c^3 + 203190542016a^{10}c^3}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{8832626880a^{11}c^3 + 64653120a^{12}c^3 - 6720a^{13}c^3 - 960a^{14}c^3 + 330786223711946433626112c^4}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-168860896838707866058752ac^4 + 22383105664203945687040a^2c^4 - 16726986497183746560a^3c^4}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-104239686251248880640a^4c^4 - 130245440433036544a^5c^4 + 187765957371977600a^6c^4}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} +
\end{aligned}$$

$$\begin{aligned}
& + \frac{3001342598673760a^7c^4 - 85207747806720a^8c^4 - 2541885524640a^9c^4 - 11611797120a^{10}c^4}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{201764640a^{11}c^4 + 1962240a^{12}c^4 + 3360a^{13}c^4 + 76696311130024412971008c^5}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-30155794084574210375680ac^5 + 2737703814670849841152a^2c^5 + 71925252918545478144a^3c^5}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-10436737037868418816a^4c^5 - 215952412981683840a^5c^5 + 11177621240050496a^6c^5}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{335521585779072a^7c^5 - 610214582208a^8c^5 - 97158821760a^9c^5 - 853435968a^{10}c^5 + 88704a^{11}c^5}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{14784a^{12}c^5 + 12882155956746673192960c^6 - 3873167547042866888704ac^6}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{223078849412160974848a^2c^6 + 12307957883649455104a^3c^6 - 626568475975805440a^4c^6}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-24714927694057216a^5c^6 + 279373545365376a^6c^6 + 17078857724544a^7c^6 + 117524816640a^8c^6}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-1479582720a^9c^6 - 17238144a^{10}c^6 - 29568a^{11}c^6 + 1614739852415051235328c^7}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-366289727284047609856ac^7 + 11428642405941026816a^2c^7 + 1124217772101980160a^3c^7}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-19620139023513600a^4c^7 - 1448430437465088a^5c^7 - 4638476688384a^6c^7 + 444154275840a^7c^7}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{4876861440a^8c^7 - 506880a^9c^7 - 101376a^{10}c^7 + 153904706400973225984c^8}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-25814484746842316800ac^8 + 266052344275998720a^2c^8 + 65419232628034560a^3c^8}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-2322924172800a^4c^8 - 49487966744832a^5c^8 - 513930869760a^6c^8 + 5072770560a^7c^8 + 73751040a^8c^8}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{126720a^9c^8 + 11274134322544377856c^9 - 1358960792457748480ac^9 - 8269540861204480a^2c^9}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{2522723887523840a^3c^9 + 26144095577600a^4c^9 - 962333532160a^5c^9 - 14088954880a^6c^9}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{1464320a^7c^9 + 366080a^8c^9 + 637294279304151040c^{10} - 53034831151464448ac^{10}}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-996988880183296a^2c^{10} + 63623584088064a^3c^{10} + 1083194112000a^4c^{10} - 8792655872a^5c^{10}}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} +
\end{aligned}$$

$$\begin{aligned}
& + \frac{-170153984a^6c^{10} - 292864a^7c^{10} + 27731905852997632c^{11} - 1503483152138240ac^{11}}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{-43006124621824a^2c^{11} + 979829760000a^3c^{11} + 21518049280a^4c^{11} - 2236416a^5c^{11} - 745472a^6c^{11}}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{920131294724096c^{12} - 29722879606784ac^{12} - 1082306068480a^2c^{12} + 7460311040a^3c^{12}}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{216186880a^4c^{12} + 372736a^5c^{12} + 22843387019264c^{13} - 376857313280ac^{13} - 16552632320a^2c^{13}}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \frac{1720320a^3c^{13} + 860160a^4c^{13} + 410617118720c^{14} - 2459402240ac^{14} - 142295040a^2c^{14} - 245760a^3c^{14}}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} + \\
& + \left[\frac{5044699136c^{15} - 524288ac^{15} - 524288a^2c^{15} + 37879808c^{16} + 65536ac^{16} + 131072c^{17}}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a+35}{2})} \right]
\end{aligned}$$

After simplification , the result (8) is proved.

REFERENCES RÉFÉRENCES REFERENCIAS

1. Arora, Asish, Singh, Rahul , Salahuddin. ; Development of a family of summation formulae of half argument using Gauss and Bailey theorems *Journal of Rajasthan Academy of Physical Sciences.*, 7(2008), 335-342.
2. Erdélyi, A., Magnus, W., Okerhettiger, F. and Tricomi, F. G.; *Higher transcendental functions* Vol.1 (Bateman Manuscript Project) McGraw- Hill book P. Inc. New York, Toronto and London, 1953.
3. Krupnikov, E. D., K\"{o}lbig, K. S.; Some special cases of the generalized hypergeometric function ${}_{q+1}F_q$ *Journal of computational and Applied Math.*, 78(1997), 79-95.
4. Lavoie, J. L.; Notes on a paper by J. B. Miller, *J. Austral. Math. Soc. Ser. B*, 29(1987), 216-220.
5. Lavoie, J. L.; Some summation formulae for the series ${}_3F_2$, *Math. Comput.*, 49(1987), 269-274.
6. Lavoie, J. L., Grondin, F. and Rathie, A.K.; Generalizations of Watson's theorem on the sum of a ${}_3F_2$, *Indian J. Math.*, 34(1992), 23-32.
7. Lavoie, J. L., Grondin, F. and Rathie, A.K.; Generalizations of Whipple's theorem on the sum of a ${}_3F_2$, *J. Comput. Appl. Math.*, 72(1996), 293-300.
8. Lavoie, J. L., Grondin, F. Rathie, A. K. and Arora, K.; Generalizations of Dixon's theorem on the sum of a ${}_3F_2$, *Math. Comput.*, 62, 267-276.
9. Mitra, C. S.; *J. Indian Math. Soc. (N.S.)*, 7(1943), 102-109.
10. Prudnikov, A. P., Brychkov, Yu. A. and Marichev, O.I.; *Integrals and Series Vol. 3: More Special Functions*. Nauka, Moscow, 1986. Translated from the Russian by G.G. Gould, Gordon and Breach Science Publishers .
11. New York, Philadelphia, London, Paris, Montreux, Tokyo, Melbourne, 1990.
12. Rainville, E. D.; The contiguous function relations for pF_q with applications to Bateman's $J_n^{u,v}$ and Rice' $H_n(\zeta, p, \nu)$, *Bull. Amer. Math. Soc.*, 51(1945), 714-723.
13. Salahuddin, Chaudhary, M.P ; Development of Some Summation Formulae Using Hypergeometric Function, *Journal of Science Frontier Research*, 10(2010), 36- 48.

This page is intentionally left blank