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FOURIER SERIES FOR H-FUNCTION OF TWO VARIABLES I

By N.S. Hora

1. Introduction

The H-function of two variables defined by Munot and Kalla [6] has been denoted by Gulati [3] as

$$H_{(p_1,p_2),p_3;(q_1,q_2),q_3}^{(m_1,m_2);(n_1,n_2),n_3}\left[\begin{array}{c|c} y & [(a_{p_1}, A_{p_1})];\ [(c_{p_2}, C_{p_2})];\ [(e_{p_3}, E_{p_3})] \\ z & [(b_{q_1}, B_{q_1})];\ [(d_{q_2}, D_{q_2})];\ [(f_{q_3}, F_{q_3})] \end{array}\right]$$

$$=\frac{1}{(2\pi i)^2}\int_{L_1}\int_{L_2}\frac{\prod_{j=1}^{m_1}\Gamma(b_j-B_js)\prod_{j=1}^{n_1}\Gamma(1-a_j+A_js)\prod_{j=1}^{m_2}\Gamma(d_j-D_jt)\prod_{j=1}^{n_2}\Gamma(1-c_j+C_jt)}{\prod_{j=m_1+1}^{q_1}\Gamma(1-b_j+B_js)\prod_{j=n_1+1}^{p_1}\Gamma(a_j-A_js)\prod_{j=m_2+1}^{q_2}\Gamma(1-d_j+D_jt)}$$

$$\times\frac{\prod_{j=1}^{n_3}\Gamma(1-e_j+E_js+E_jt)\,y^sz^t ds\,dt}{\prod_{j=n_2+1}^{p_2}\Gamma(c_j-C_jt)\prod_{j=n_3+1}^{p_3}\Gamma(e_j-E_js-E_jt)\prod_{j=1}^{q_3}\Gamma(1-f_j+F_js+F_jt)}. \tag{1.1}$$

L_1 and L_2 are suitable contours of Barnes type. L_1 is in the s-plane and is such that the poles of $\Gamma(b_j-B_js)$, $j=1, \cdots, m_1$ lie on the right and the poles of $\Gamma(1-a_j+A_js)$, $j=1, \cdots, n_1$ and $\Gamma(1-e_j+E_js+E_jt)$, $j=1, \cdots, n_3$ lie on the left of the contour. Similarly the contour L_2 is in the t-plane and is such that the poles of $\Gamma(d_j-D_jt)$, $j=1, \cdots, m_2$ lie on the right and the poles of $\Gamma(1-c_j+C_jt)$, $j=1, \cdots, n_2$ and $\Gamma(1-e_j+E_js+E_jt)$, $j=1, \cdots, n_3$ on the left of the contour.

$$0\leq m_1\leq q_1,\ 0\leq m_2\leq q_2,\ 0\leq n_1\leq p_1,\ 0\leq n_2\leq p_2,\ 0\leq n_3\leq p_3.$$

The double integral converges if

$$\sum_{j=1}^{p_1}A_j+\sum_{j=1}^{p_3}E_j-\sum_{j=1}^{q_1}B_j-\sum_{j=1}^{q_3}F_j<0,\quad \sum_{j=1}^{p_2}C_j+\sum_{j=1}^{p_3}E_j-\sum_{j=1}^{q_2}D_j-\sum_{j=1}^{q_3}F_j<0,$$

$$\sum_{j=1}^{n_1}A_j-\sum_{j=n_1+1}^{p_1}A_j+\sum_{j=1}^{n_3}E_j-\sum_{j=n_3+1}^{p_3}E_j+\sum_{j=1}^{m_1}B_j-\sum_{j=m_1+1}^{q_1}B_j-\sum_{j=1}^{q_3}F_j\equiv\alpha>0,$$

$$\sum_{j=1}^{n_2}C_j-\sum_{j=n_2+1}^{p_2}C_j+\sum_{j=1}^{n_3}E_j-\sum_{j=n_3+1}^{p_3}E_j+\sum_{j=1}^{m_2}D_j-\sum_{j=m_2+1}^{q_2}D_j-\sum_{j=1}^{q_3}F_j\equiv\beta>0,$$

and $|\arg y|<\frac{1}{2}\alpha\pi$, $|\arg z|<\frac{1}{2}\beta\pi$.

Here as well as in what follows $[(a_p, A_p)]$ represents the set of parameters (a_1, A_1), (a_2, A_2), $\cdots$, (a_p, A_p). The symbol (a_p) stands for a_1, a_2, $\cdots$, a_p. The capital letters throughout this paper, represent positive integers.

The right hand side of (1.1) shall, hence forth, be denoted by $H\begin{bmatrix} y \\ z \end{bmatrix}$ and is the required H-function of two variables.

The following formulae are required in the proof:

$$\frac{\sqrt{\pi}}{2}\frac{\Gamma(2-s)}{\Gamma\left(\frac{3}{2}-s\right)}(\sin\theta)^{1-2s}=\sum_{r=0}^{\infty}\frac{(s)_r}{(2-s)_r}\sin(2r+1)\theta \quad \left(0\leq\theta\leq\pi,\ \mathrm{Re}\ s\leq\frac{1}{2}\right)$$

which follows from [8, p.79] (1.2)

$$\sqrt{\pi}\frac{\Gamma(1-s)}{\Gamma\left(\frac{1}{2}-s\right)}\left(\sin\frac{\theta}{2}\right)^{-2s}=1+2\sum_{r=1}^{\infty}\frac{(s)_r}{(1-s)_r}\cos r\theta \quad \left(0\leq\theta\leq\pi,\ \mathrm{Re}\ s\leq\frac{1}{2}\right)$$

which follows from [7, p.143]. (1.3)

$$\sqrt{\pi}\frac{\Gamma(s+1)}{\Gamma\left(s+\frac{1}{2}\right)}\left(\cos\frac{\theta}{2}\right)^{2s}=1+2\sum_{r=1}^{\infty}\frac{(-1)^r(-s)^r}{(s+1)_r}\cos r\theta \quad \left(0\leq\theta\leq\pi,\ \mathrm{Re}\ s>-\frac{1}{2}\right)$$

which is same as [9, p.108 4(2.2)]. (1.4)

2. The Fourier series to be established are

$$\sqrt{\pi}(\sin\theta)^{1-2\zeta}H^{(m_1,m_2);\ (n_1,n_2),n_3}_{(p_1,p_2),p_3;\ (q_1,q_2),q_3}\left[\begin{matrix} y(\sin\theta)^{-2l} \\ z\end{matrix}\middle|\begin{matrix}[(a_{p_1},A_{p_1})];\ [(c_{p_2},C_{p_2})];\ [(e_{p_3},E_{p_3})] \\ [(b_{q_1},B_{q_1})];\ [(d_{q_2},D_{q_2})];\ [(f_{q_3},F_{q_3})]\end{matrix}\right]$$

$$=2\sum_{r=0}^{\infty}H^{(m_1+1,m_2);(n_1+1,n_2),n_3}_{(p_1+2,p_2),p_3;(q_1+2,q_2),q_3}\left[\begin{matrix} y \\ z\end{matrix}\middle|\begin{matrix}(1-\zeta-r,l),\ [(a_{p_1},A_{p_1})],\ (2-\zeta+r,l);\ [(c_{p_2},C_{p_2})];\ (e_{p_3},E_{p_3})] \\ \left(\frac{3}{2}-\zeta,l\right),\ [(b_{q_1},B_{q_1})],\ (1-\zeta,l);\ [(d_{q_2},D_{q_2})];\ [(f_{q_3},F_{q_3})]\end{matrix}\right]\sin(2r+1)\theta$$

(2.1)

where Re $(1-2\zeta)\geq0$, $0\leq\theta\leq\pi$.

Other conditions of validity are same as for (1.1).

$$\sqrt{\pi}(\sin\theta)^{1-2\zeta}H^{(m_1,m_2);\ (n_1,n_3),n_3}_{(p_1,p_2),p_3;\ (q_1,q_3),q_3}\left[\begin{matrix} y \\ z(\sin\theta)^{-2l}\end{matrix}\middle|\begin{matrix}[(a_{p_1},A_{p_1})];\ [(c_{p_2},C_{p_2})];\ [(e_{p_3},E_{p_3})] \\ [(b_{q_1},B_{q_1})];\ [(d_{q_2},D_{q_2})];\ [(f_{q_3},F_{q_3})]\end{matrix}\right]$$

$$= 2\sum_{r=0}^{\infty} H^{(m_1, m_2+1);\ (n_1, n_2+1), n_3}_{(p_1, p_2+2), p_3;\ (q_1, q_2+2), q_3}\left[\begin{matrix} y \\ z \end{matrix}\middle| \begin{matrix} [(a_{p_1}, A_{p_1})];\ (1-\zeta-r, l),\ [(c_{p_2}, C_{p_2})],\ (2-\zeta+r, l);\ [(e_{p_3}, E_{p_3})] \\ [(b_{q_1}, B_{q_1})];\ \left(\frac{3}{2}-\zeta, l\right),\ [(d_{q_2}, D_{q_2})],\ (1-\zeta, l);\ [(f_{q_3}, F_{q_3})] \end{matrix}\right] \sin(2r+1)\theta \tag{2.2}$$

conditions of validity are same as for (2.1).

$$\sqrt{\pi}\, H^{(m_1, m_2);\ (n_1, n_2), n_3}_{(p_1, p_2), p_3;\ (q_1, q_2), q_3}\left[\begin{matrix} y\left(\cos\frac{\theta}{2}\right)^{2l} \\ z \end{matrix}\middle| \begin{matrix} [(a_{p_1}, A_{p_1})];\ [(c_{p_2}, C_{p_2})];\ [(e_{p_3}, E_{p_3})] \\ [(b_{q_1}, B_{q_1})];\ [(d_{q_2}, D_{q_2})];\ [(f_{q_3}, F_{q_3})] \end{matrix}\right]$$

$$= H^{(m_1, m_2);\ (n_1+1, n_2), n_3}_{(p_1+1, p_2), p_3;\ (q_1+1, q_2), q_3}\left[\begin{matrix} y \\ z \end{matrix}\middle| \begin{matrix} \left(\frac{1}{2}, l\right), [(a_{p_1}, A_{p_1})];\ [(c_{p_2}, C_{p_2})];\ [(e_{p_3}, E_{p_3})] \\ [(b_{q_1}, B_{q_1})],\ (0, l);\ [(d_{q_2}, D_{q_2})];\ [(f_{q_3}, F_{q_3})] \end{matrix}\right]$$

$$+2\sum_{r=1}^{\infty} H^{(m_1, m_2);\ (n_1+2, n_2), n_3}_{(p_1+2, p_2), p_3;\ (q_1+2, q_2), q_3}\left[\begin{matrix} y \\ \\ z \\ \end{matrix}\middle| \begin{matrix} \left(\frac{1}{2}, l\right),\ (0, l),\ [(a_{p_1}, A_{p_1})]; \\ [(c_{p_2}, C_{p_2})];\ [(e_{p_3}, E_{p_3})] \\ [(b_{q_1}, B_{q_1})],\ (-r, l),\ (r, l); \\ [(d_{q_2}, D_{q_2})];\ [(f_{q_3}, F_{q_3})] \end{matrix}\right] \cos r\theta \tag{2.3}$$

conditions of validity are same as for (1.1) and (1.4).

$$\sqrt{\pi}\, H^{(m_1, m_2);\ (n_1, n_2), n_3}_{(p_1, p_2), p_3;\ (q_1, q_2), q_3}\left[\begin{matrix} y \\ z\left(\cos\frac{\theta}{2}\right)^{2l} \end{matrix}\middle| \begin{matrix} [(a_{p_1}, A_{p_1})];\ [(c_{p_2}, C_{p_2})];\ [(e_{p_3}, E_{p_3})] \\ [(b_{q_1}, B_{q_1})];\ [(d_{q_2}, D_{q_2})];\ [(f_{q_3}, F_{q_3})] \end{matrix}\right]$$

$$= H^{(m_1, m_2);\ (n_1, n_2+1), n_3}_{(p_1, p_2+1), p_3;\ (q_1, q_2+1), q_3}\left[\begin{matrix} y \\ z \end{matrix}\middle| \begin{matrix} [(a_{p_1}, A_{p_1})];\ \left(\frac{1}{2}, l\right),\ [(c_{p_2}, C_{p_2})];\ [(e_{p_3}, E_{p_3})] \\ [(b_{q_1}, B_{q_1})];\ [(d_{q_2}, D_{q_2})],\ (0, l);\ [(f_{q_3}, F_{q_3})] \end{matrix}\right]$$

$$+ 2\sum_{r=1}^{\infty} H^{(m_1, m_2);\ (n_1, n_2+2), n_3}_{(p_1, p_2+2), p_3;\ (q_1, q_2+2), q_3}\left[\begin{matrix} y \\ \\ z \\ \end{matrix}\middle| \begin{matrix} [(a_{p_1}, A_{p_1})];\ \left(\frac{1}{2}, l\right),\ (0, l), \\ [(c_{p_2}, C_{p_2})];\ [(e_{p_3}, E_{p_3})] \\ [(b_{q_1}, B_{q_1})];\ [(d_{q_2}, D_{q_2})], \\ (-r, l),\ (r, l);\ [(f_{q_3}, F_{q_3})] \end{matrix}\right] \cos r\theta \tag{2.4}$$

conditions of validity are same as for (1.1) and (1.4).

$$\sqrt{\pi}\, H^{(m_1, m_2);\ (n_1, n_2), n_3}_{(p_1, p_2), p_3;\ (q_1, q_2), q_3}\left[\begin{matrix} y\left(\cos\frac{\theta}{2}\right)^{2l} \\ z\left(\cos\frac{\theta}{2}\right)^{2l} \end{matrix}\middle| \begin{matrix} [(a_{p_1}, A_{p_1})];\ [(c_{p_2}, C_{p_2})];\ [(e_{p_3}, E_{p_3})] \\ [(b_{q_1}, B_{q_1})];\ [(d_{q_2}, D_{q_2})];\ [(f_{q_3}, F_{q_3})] \end{matrix}\right]$$

$$= H^{(m_1,m_2):(n_1,n_2),n_3+1}_{(p_1,p_2),p_3+1:(q_1,q_2),q_3+1}\left[\begin{array}{c|l} y & [(a_{p_1}, A_{p_1})];\ [(c_{p_2}, C_{p_2})];\ \left(\frac{1}{2}, l\right), [(e_{p_3}, E_{p_3})] \\ z & [(b_{q_1}, B_{q_1})];\ [(d_{q_2}, D_{q_2})];\ [(f_{q_3}, F_{q_3})], (0, l) \end{array}\right]$$

$$+ 2\sum_{r=1}^{\infty} H^{(m_1,m_2):(n_1,n_2),n_3+2}_{(p_1,p_2),p_3+2:(q_1,q_2),q_3+2}\left[\begin{array}{c|l} y & [(a_{p_1}, A_{p_1})] : [c_{p_2}, C_{p_2})] : \\ & \left(\frac{1}{2}, l\right), (0, l), [(e_{p_3}, E_{p_3})] \\ z & [(b_{q_1}, B_{q_1})] : [(d_{q_2}, D_{q_2})] : \\ & [(f_{q_3}, F_{q_3})] (-r, l), (r, l) \end{array}\right] \cos r\theta \quad (2.5)$$

The conditions of validity being the same as in (1.1) and (1.4).

$$\sqrt{\pi}\left(\sin\frac{\theta}{2}\right)^{-2\zeta} H^{(m_1,m_2):(n_1,n_2),n_3}_{(p_1,p_2),p_3:(q_1,q_2),q_3}\left[\begin{array}{c|l} y\left(\sin\frac{\theta}{2}\right)^{-2l} & [(a_{p_1}, A_{p_1})];\ [(c_{p_2}, C_{p_2})]; \\ & [(e_{p_3}, E_{p_3})] \\ z & [(b_{q_1}, B_{q_1})];\ [(d_{q_2}, D_{q_2})]; \\ & [(f_{q_3}, F_{q_3})] \end{array}\right]$$

$$= H^{(m_1+1,m_2):(n_1,n_2),n_3}_{(p_1+1,p_2),p_3:(q_1+1,q_2),q_3}\left[\begin{array}{c|l} y & [(a_{p_1}, A_{p_1})], (1-\zeta, l); [(c_{p_2}, C_{p_2})]; [(e_{p_3}, E_{p_3})] \\ z & \left(\frac{1}{2}-\zeta, l\right), [(b_{q_1}, B_{q_1})]; [(d_{q_2}, D_{q_2})]; [(f_{q_3}, F_{q_3})] \end{array}\right]$$

$$+ 2\sum_{r=1}^{\infty} H^{(m_1+1,m_2):(n_1+1,n_2),n_3}_{(p_1+2,p_2),p_3:(q_1+2,q_2),q_3}\left[\begin{array}{c|l} y & (1-\zeta-r, l), [(a_{p_1}, A_{p_1})], (1-\zeta+r, l); \\ & [(c_{p_2}, C_{p_2})]; [(e_{p_3}, E_{p_3})] \\ z & \left(\frac{1}{2}-\zeta, l\right), [(b_{q_1}, B_{q_1})], (1-\zeta, l); \\ & [(d_{q_2}, D_{q_2})]; [(f_{q_3}, F_{q_3})] \end{array}\right] \cos r\theta \quad (2.6)$$

where Re $2\zeta \leq 0$, $0 \leq \theta \leq \pi$,
other conditions of validity are same as for (1.1).

$$\sqrt{\pi}\left(\sin\frac{\theta}{2}\right)^{-2\zeta} H^{(m_1,m_2):(n_1,n_2),n_3}_{(p_1,p_2),p_3:(q_1,q_2),q_3}\left[\begin{array}{c|l} y & [(a_{p_1}, A_{p_1})];\ [(c_{p_2}, C_{p_2})]; \\ & (e_{p_3}, E_{p_3}) \\ z\left(\sin\frac{\theta}{2}\right)^{-2l} & [(b_{q_1}, B_{q_1})];\ [(d_{q_2}, D_{q_2})]; \\ & [(f_{q_3}, F_{q_3})] \end{array}\right]$$

$$= H^{(m_1,m_2+1):(n_1,n_2),n_3}_{(p_1,p_2+1),p_3:(q_1,q_2+1),q_3}\left[\begin{array}{c|l} y & [(a_{p_1}, A_{p_1})];\ [(c_{q_2}, C_{p_2})], (1-\zeta, l);\ [(e_{p_3}, E_{p_3})] \\ z & [(b_{p_1}, B_{q_1})]; \left(\frac{1}{2}-\zeta, l\right), [(d_{q_2}, D_{q_2})]; [(f_{q_3}, F_{q_3})] \end{array}\right]$$

$$+2\sum_{r=1}^{\infty} H^{(m_1,m_2+1);\,(n_1,n_2+1),n_3}_{(p_1,p_2+2),p_3;\,(q_1,q_2+2),q_3}\left[\begin{matrix} y \\ \\ z \\ \end{matrix}\left|\begin{matrix}[(a_{p_1},A_{p_1})];(1-\zeta-r,l),\ [(c_{p_2},C_{p_2})], \\ (1-\zeta+r,l);[(e_{p_3},E_{p_3})] \\ [(b_{q_1},B_{q_1})];\left(\frac{1}{2}-\zeta,l\right),\ [(d_{q_2},D_{q_2})], \\ (1-\zeta,l);[(f_{q_3},F_{q_3})]\end{matrix}\right.\right]\cos r\theta \qquad (2.7)$$

the conditions of validity are same as for (2.6).

PROOF. (2.1) can be established by expressing the H-function on the left as (1.1), substituting for $(\sin\theta)^{1-2\zeta-2ls}$ from (1.2) and changing the order of integration and summation.

(2.2) can be established by the same proceedure as above for (2.1). The expansions (2.3), (2.4) and (2.5) can be established by using (1.4). (2.6) and (2.7) are proved from (1.1) and (1.3). The rest of the proceedure is same in all cases as for (2.1).

Particular cases. Reducing H-function of two variables to Kampé de Fériet function with the help of the formula given by Gulati [3, 1.5] viz.

$$H^{(1,1);\,(m,m),l}_{(m,m),l:\,(p+1,p+1),n}\left[\begin{matrix} -y \\ \\ -z \\ \end{matrix}\left|\begin{matrix}(1-b_1,1),\cdots,(1-b_m,1);(1-c_1,1),\cdots,(1-c_m,1); \\ (1-a_1,1),\cdots,(1-a_l,1) \\ (0,1),(1-e_1,1),\cdots,(1-e_p,1);(0,1),(1-f_1,1), \\ \cdots,(1-f_p,1);(1-d_1,1),\cdots,(1-d_n,1)\end{matrix}\right.\right]$$

$$=\frac{\prod_{j=1}^{l}\Gamma a_j\prod_{j=1}^{m}\Gamma b_j\prod_{j=1}^{m}\Gamma c_j}{\prod_{j=1}^{n}\Gamma d_j\prod_{j=1}^{p}\Gamma e_j\prod_{j=1}^{p}\Gamma f_j}F\left[\begin{matrix} l \\ m \\ n \\ p\end{matrix}\left|\begin{matrix} a_1,\cdots,a_l \\ b_1,c_1,\cdots,b_m,c_m \\ d_1,\cdots,d_n \\ e_1,f_1,\cdots,e_p,f_p\end{matrix}\right| y,z\right]$$

we get from (2.5)

$$F\left[\begin{matrix} l \\ m \\ n \\ p\end{matrix}\left|\begin{matrix} a_1,\cdots,a_l \\ b_1,c_1,\cdots,b_m,c_m \\ d_1,\cdots,d_n \\ e_1,f_1,\cdots,e_p,f_p\end{matrix}\right| y\left(\cos\frac{\theta}{2}\right)^2,\ z\left(\cos\frac{\theta}{2}\right)^2\right]$$

$$=F\left[\begin{matrix} l+1 \\ m \\ n+1 \\ p\end{matrix}\left|\begin{matrix} \frac{1}{2},a_1,\cdots\cdots,a_l \\ b_1,c_1,\cdots\cdots,b_m,c_m \\ d_1,\cdots\cdots,d_n,1 \\ e_1,f_1,\cdots\cdots,e_p,f_p\end{matrix}\right| y,\ z\right]$$

$$+2\sum_{r=1}^{\infty}\frac{1}{\Gamma(1+r)\Gamma(1-r)}F\left[\begin{array}{c|l} l+2 & \frac{1}{2},\ 1,\ a_1,\ \cdots\cdots,\ a_l \\ m & b_1,\ c_1,\ \cdots\cdots,\ b_m,\ c_m \\ n+2 & d_1,\ \cdots\cdots,\ d_n,\ 1+r,\ 1-r \\ p & e_1,\ f_1,\ \cdots\cdots,\ e_p,\ f_p \end{array}\middle| y,z\right]\cos r\theta \tag{2.8}$$

(ii) Taking $m_2=q_2=D_1=1$, $d_1=p_2=p_3=n_2=n_3=q_3=0$ and using the formula given by Gulati [3, 1.6] viz.

$$H^{(m_1,1);(n_1,0),0}_{(p_1,0),0;(q_1,1),0}\left[\begin{array}{c|l} y & [(a_{p_1},A_{p_1})];\ (\text{—});\ (\text{—}) \\ z & [(b_{q_1},B_{q_1})];\ (0,1);\ (\text{—}) \end{array}\right]=e^{-z}H^{m_1,n_1}_{p_1,q_1}\left(y\middle|\begin{array}{l}[(a_{p_1},A_{p_1})]\\ [(b_{q_1},B_{q_1})]\end{array}\right)$$

we get the known results obtained by Bajpai [1, p. 705(3.1) and p. 706(3.2)] as particular cases of (2.1) and (2.6).

Further putting $l=1$ and $\zeta=0$, we get another known results due to Parashar [9, 1.2, 1.3, 1.4] respectively from (2.3), (2.1) and (2.6).

(iii) The results given by Gulati [4, (4.1), (4.2), (4.3) & (4.4)] can be obtained as a particular cases of (2.1), (2.2), (2.6) and (2.7), by taking all capital letters equal to unity and making use of the formula [3, 1.3].

Further putting $m_2=q_2=1$, $n_2=n_3=p_2=p_3=q_3=0$, $l=1, \zeta=0$ in (2.1) and (2.6), and using the formula given by Bajpai [2, 1.5] viz.

$$G^{(m,1);(n,0),0}_{(p,0),0;(q,1),0}\left[\begin{array}{c|l} x & (a_p);\ \text{—} \\ & \text{—} \\ y & (b_q);\ 0 \\ & \text{—} \end{array}\right]=e^{-y}G^{m,n}_{p,q}\left(x\middle|\begin{array}{l}(a_p)\\ (b_q)\end{array}\right)$$

we get known results due to Kesarwani [5, p. 149(1.1) & (1.2)].

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Govt. College
Ratlam, India

REFERENCES

[1] Bajpai, S. D., *Fourier series of generalised hypergeometric functions*, Proc. Camb. Phil. Soc. (1969), 65, 703, PCPS 65—76.

[2] Bajpai, S. D., *Some results involving G-function of two variables*, (communicated for publication)

[3] Gulati, H. C., *Some results involving H-function of two variables*, (communicates for publication)

[4] Gulati, H. C., *Fourier series for G-function of two variables*, Gazeta De Matematica, N. 121—124, LISBOA—1971.

[5] Kesarwani, R. N., *Fourier series for Meijer's G-function*, Compositio Mathematica, vol. 17 Fasc. 2, pp. 149—151, 1966.

[6] Munot, P. C. & Kalla, S. L., Communicated for publication.

[7] MacRobert, T. M., *Infinite series for E-function*, Math. z. 71(1959), 143—145.

[8] MacRobert, T. M., *Fourier series for E-functions*, Math. z. 75(1961), 79—82.

[9] Parashar, B. P., *Fourier series for H-functions*. Proc. Camb. Phil. Soc. (1967), 63, 1083 PCPS 63—124.