A NOTE ON THE HERMITE NUMBERS AND POLYNOMIALS

DAE SAN KIM AND TAEKYUN KIM

Abstract. In this paper, we compute explicitly an integral involving the Hermite polynomials. From our computation, we derive the formula for a product of two Hermite polynomials. Finally, we give some interesting formulae for the product of two Hermite polynomials associated with Bernoulli polynomials like Carlitz did.

Mathematics subject classification (2010): 11B68, 33C45. Keywords and phrases: Hermite polynomials, Bernoulli polynomials.

REFERENCES

- [1] S. ARACI, D. ERDAL AND J. J. SEO, A study on the fermionic *p*-adic *q*-integral representation on \mathbb{Z}_p associated with weighted *q*-Bernstein and *q*-Genocchi polynomials, Abstr. Appl. Anal., **10** (2011), Article ID 649248.
- [2] A. BAYAD AND T. KIM, Identities involving values of Bernstein, q-Bernoulli, and q-Euler polynomials, Russ. J. Math. Phys., 18 (2011), 133–143.
- [3] L. CARLITZ, Note on the integral of the product of several Bernoulli polynomials, J. London Math. Soc., 34 (1959), 361–363.
- [4] T. KIM, Symmetry of power sum polynomials and multivariate fermionic p-adic invariant integral on \mathbb{Z}_p , Russ. J. Math. Phys. **16** (2009), no. 1, 93–96.
- [5] D. S. KIM, T. KIM, S. H. LEE AND Y. H. KIM, Some identities for the product of two Bernoulli and Euler polynomials, Adv. Difference Equ., 2012 (2012), Article ID 2012:95, p. 14.
- [6] D. S. KIM, T. KIM, S. H. RIM AND S. H. LEE, *Hermite polynomials and their applications associated with Bernoulli and Euler numbers*, Discerte Dyn. Nat. Soc., **2012** (2012), Article ID 974632, p. 13.
- [7] T. KIM, Some identities for the Bernoulli, teh Euler and the Genocchi numbers and polynomials, Adv. Stud. Contemp. Math, 20 (2010), 23–28.
- [8] D. S. KIM, D. V. DOLGY, H. M. KIM, S. H. LEE AND T. KIM, Integral formulas of Bernoulli polynomials, Adv. Stud. Contemp. Math, 22 (2012), 190–199.
- [9] T. KIM, Some identities on the q-Euler polynomials of higher order and q-Stirling numbers by the fermionic p-adic integral on \mathbb{Z}_p , Russ. J. Math. Phys. **16** (2009), 484–491.
- [10] C. S. RYOO, Some relations between twisted q-Euler numbers and Bernstein polynomials, Adv. Stud. Contemp. Math, 21 (2011), 217–223.
- [11] C. S. RYOO, Some identities of the twisted q-Euler numbers and polynomials associated with q-Bernstein polynomials, Proc. Jangjeon Math. Soc., 14 (2011), 239–248.
- [12] Y. SIMSEK, Generating functions of the twisted Bernoulli numbers and polynomials associated with their interpolation functions, Adv. Stud. Contemp. Math. 16 (2008) 251–278.

