Let $E(H_n; f)$ denote the best Hausdorff approximation on the interval $[-1,1]$ of the bounded function $f$ by means of algebraic polynomials of degree $n$ at most. It follows from Theorem 3 in Bl. Sendov and V. A. Popov, J. Approximation Theory 9, 102-111 (1973; Zbl 0266.41013) that $E(H_n; f) \leq cn^{-1} \ln(n\omega(f; n^{-1}))$ in the case $n\omega(f, n^{-1}) \to \infty$ as $n \to \infty$; where $\omega(f; \delta)$ is the modulus of continuity of $f$, and $c$ is an absolute constant. It is shown by the first author [C. R. Acad. Bulgare Sci. 27, 1629-1632 (1974; Zbl 0338.41024)] that the order in this estimate is exact for the classes Lip $\alpha$, $0 < \alpha < 1$. Here an extension of this result is done for the classes of functions with a given modulus of continuity. The following theorem is proved: Theorem. Let $\omega(\delta)$ be a given convex upward modulus of continuity such that $\omega^{-1}$ exists and $\delta^{-1}, \omega(\delta) \to \infty$ as $\delta \to 0$. Then there exists a function $\phi$ defined on $[-1,1]$, a constant $c_1 > 0$, and a sequence of integers $\{n_k\}_{k=1}^{\infty}$ for which $\omega(\phi; \delta) \leq \omega(\delta)$, $0 < n_1 < n_2 < \ldots < n_k < \ldots$ and $E(H_{n_k}; \phi) > c_1 n_k^{-1} \ln(n_k \omega(n_k^{-1}))$, $k = 1, 2, \ldots$.

MSC:

41A10 Approximation by polynomials
41A50 Best approximation, Chebyshev systems
26A15 Continuity and related questions (modulus of continuity, semicontinuity, discontinuities, etc.) for real functions in one variable

Keywords:

best Hausdorff approximation; algebraic polynomials; estimate; modulus of continuity