Name: KEY Sec: 5, 16 $\cancel{4} = 8$

ID: KEY FORM(A) $\cancel{8} = \cancel{4}$

(1) The coefficient of x^{10} in the Maclaurin series of $f(x) = 6\sin(x^2)$ is equal to: (a) 1 (b) 0 (c) -1 (d) $1/20$ (e) $3/5$	(4) A power series representing the function $f(x) = \dfrac{3x^5}{(x-3)^2}$ is (a) $\sum_{n=1}^{\infty} \frac{n x^{n+4}}{3^n}$ (b) $\sum_{n=1}^{\infty} \frac{x^{n+5}}{3^n}$ (c) $\sum_{n=1}^{\infty} \frac{n x^{n+2}}{3^{n+2}}$ (d) $\sum_{n=1}^{\infty} \frac{n x^{n+2}}{3^n}$ (e) $\sum_{n=1}^{\infty} \frac{x^{n+2}}{3^n}$
(2) The sum of the series $\sum_{n=0}^{\infty} \dfrac{(-1)^n 3^{2n+1} \cdot \pi^{3n+1}}{4^{2n+1}(2n+1)!}$ is (a) $\sqrt{3}$ (b) $\sqrt{3}/2$ (c) $1/\sqrt{2}$ (d) $\sqrt{2}$ (e) $1/2$	(5) For which values of P, the series $\sum_{n=1}^{\infty} n(1+n^2)^{2P+1}$ is convergent (a) $P > 2$ (b) $P > -1$ (c) $P > 0$ (d) $P < 0$ (e) $P < -1$
(3) If the Maclaurin series of $(1+x)^{5/2}$ is $A + Bx + Cx^2 + Dx^3 + \cdots$ then $C + D =$ (a) $25/16$ (b) $45/16$ (c) $35/16$ (d) $45/8$ (e) $35/8$	(6) Using the Maclaurin series for $f(x) = \dfrac{1}{(1-x)^2}$, we find that the sum of the series $\sum_{n=3}^{\infty} \frac{n}{5^n}$ equals (a) $11/400$ (b) $13/400$ (c) $15/400$ (d) $17/400$ (e) $19/400$

7. The series $\sum_{n=1}^{\infty} (-1)^n \frac{3^{n-1}}{2^{2n+1}} =$

(a) $-1/14$

(b) $-1/6$

(c) $6/7$

(d) $3/7$

(e) divergent

8. The smallest number of terms needed in order to find the sum of the series $\sum_{n=3}^{\infty} \frac{(-1)^n}{n^{3/2}}$ with |error| less than 0.001, is

(a) 198

(b) 148

(c) 98

(d) 48

(e) 8

$n = 100$

$\sum_{n=3}^{100}$

9. The series $\sum_{n=1}^{\infty} e^{-n} n!$

(a) diverges by the integral test

(b) diverges by the ratio test

(c) converges by the Comparison test

(d) converges by the ratio test

(e) Converges by the test for divergence

10. The radius of Convergence of the power series $\sum_{n=0}^{\infty} \frac{(x-1)^{n+1}}{3^{n+1}}$ is

(a) $R = 1$

(b) $R = 1/3$

(c) $R = 3$

(d) $R = 0$

(e) $R = \infty$

11. The coefficient of $(x-\frac{\pi}{2})^5$ in the Taylor series of $f(x) = \sin(2x)$ about $a = \pi/2$ equals

(a) -4

(b) $4/3$

(c) $-4/15$

(d) 0

(e) $4/15$

12. If the power series $\sum_{n=0}^{\infty} c_n (x+4)^n$ has a radius of convergence $R = 5$, then which one of the following is TRUE?

(a) $\sum_{n=0}^{\infty} c_n$ divg

(b) $\sum_{n=0}^{\infty} (-1)^n c_n$ divg

(c) $\sum_{n=0}^{\infty} 7^n c_n$ conv

(d) $\sum_{n=0}^{\infty} (-1)^n 7^n c_n$ conv

(e) $\sum_{n=0}^{\infty} c_n 2^{-n}$ conv