Name:	**ID:**	**Sec: 10**

MATH-102 **Term-142** **CQ-MAC** **FORM A**

(show all your work and circle one letter to get a full mark or you will get zero)

1) The interval of convergence of the series $\sum_{n=1}^{\infty} \frac{(x+1)^n}{n \cdot 2^n}$ is

(a) $[-3,1)$
(b) $(-3,1]$
(c) $[-3,1]$
(d) $[-0.5,0.5]$
(e) $[-0.5,0.5)$
(f) none of the above

2) If $g(x) = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \cdots$ then, the coefficient of x^5 in the Maclaurin series of $\frac{g(x)}{1-x}$ is

(a) -15/24
(b) 11/24
(c) 13/24
(d) -13/24
(e) -11/24
(f) none of the above

3) The power series representation for the function $f(x) = \frac{27x^2}{1+3x^2}$ is

(a) $\sum_{n=0}^{\infty} (-1)^n 3^n x^{2n}$
(b) $\sum_{n=0}^{\infty} (-1)^n 3^{n+2} x^{2n+2}$
(c) $\sum_{n=0}^{\infty} (-1)^n 3^{n+3} x^{2n+2}$
(d) $\sum_{n=0}^{\infty} (-1)^n 3^{n+1} x^{2n+2}$
(e) $\sum_{n=0}^{\infty} \frac{(-1)^n 3^{n-2} x^{2n+2}}{2}$
(f) none of the above

4) if the Maclaurin series of $e^x \cos x$ is $A + Bx + Cx^2 + Dx^3 + \cdots\cdots$ then C+D =

(a) 1/2
(b) 2/3
(c) -1/3
(d) 0
(e) 1
(f) none of the above

5) $\int \frac{1}{x^2}\cos(x^3)dx =$

(a) $\sum_{n=0}^{\infty} \frac{(-1)^n x^{6n-1}}{(2n)!(3n-1)}$

(b) $\sum_{n=0}^{\infty} \frac{(-1)^n x^{6n-2}}{(2n)!(6n-2)}$

(c) $\sum_{n=0}^{\infty} \frac{(-1)^n x^{6n-1}}{(2n+1)!(6n-1)}$

(d) $\sum_{n=3}^{\infty} \frac{(-1)^n x^{6n-1}}{(2n)!(6n-1)}$

(e) $\sum_{n=0}^{\infty} \frac{(-1)^n x^{6n-1}}{(2n)!(6n-1)}$

(f) none of the above

6) Let $g(x) = x^3 \tan^{-1} x$ and let $g''(x) = \sum_{n=0}^{\infty} c_n x^n$ then $c_{10} =$

(a) 144/8

(b) 44/3

(c) 14/5

(d) 0

(e) 10

(f) none of the above

6) The radius of convergence of the series $\sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{2^{2n}(n!)^2}$ is

(a) 0

(b) ∞

(c) 1

(d) 2

(e) 3

(f) none of the above

7) The radius of convergence of the series $\sum_{n=1}^{\infty} \frac{n!(x+1)^{2n}}{2}$ is

(a) 0

(b) ∞

(c) 1

(d) 2

(e) 3

(f) none of the above

2) The interval of convergence of the series $\sum_{n=5}^{\infty} \frac{(-1)^n x^n}{4^n \cdot n^3}$ is

(a) [–5,5]

(b) [–5,5)

(c) (–5,5]

(d) [–4,4]

(e) (–4,4)

(f) none of the above

4) $1-\frac{1}{2}+\frac{1}{3}-\frac{1}{4}+\frac{1}{5}-\frac{1}{6}+\cdots\cdots =$

(a) π/4

(b) 1

(c) ln(2)

(d) e

(e) -1

(f) none of the above