Name: KEY ID: KEY Sec: 34(11:00-11:50) 23(1:10-2:00)

MATH-102 Term-132 CQ-13

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

1) $\sum_{n=2}^{\infty} \frac{(-1)^{n-1} \cdot 3^{n-1}}{5^{n+1}} =$

(a) 0.025
(b) 0.015
(c) 0.6
(d) 0.46
(e) 0.035
(f) none of the above

$a = \frac{-3}{5^3}$, $r = \frac{-3}{5}$

$Sum = \frac{a}{1-r} = \frac{-3/5^3}{1+\frac{3}{5}} = \frac{-3}{5^3+3\times 25}$

$= \frac{-3}{25(5+3)} = \frac{-3}{(100)(2)} = \frac{-3/2}{100}$

$= \frac{-1.5}{100} = -0.0\overset{5}{\cdot}15$

$= -0.015$

$(-1)^{2-1} 3$

2) The sequence $\left\{\frac{(1!)(1)}{3!}, -\frac{(2!)(2)}{4!}, \frac{(3!)(3)}{5!}, -\frac{(4!)(4)}{6!}, \ldots\right\}$

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

$a_n = \frac{(n!)(n)}{(n+2)!}(-1)^{n+1} = \frac{n}{(n+2)(n+1)}(-1)^{n+1}$

$|a_n| \longrightarrow 0 \Rightarrow a_n \to 0$

$\lim_{n\to\infty} |a_n| = 0 \Longrightarrow \lim_{n\to\infty} a_n = 0$