King Fahd University of Petroleum and Minerals

Quiz: 4    Math 102   Semester: 151    Duration: 45 minutes

Full Name:                                                    ID:

Section:                          Serial number:

**Question 1** Determine whether each of the following series is convergent or divergent. (Justify your answer)

$$a) \sum_{n=1}^{\infty} \tan^{-1} n$$

$$b) \sum_{n=3}^{\infty} \frac{1}{n + n \ln n}$$

$$c) \sum_{n=3}^{\infty} \frac{\cos(\pi/n) + 1}{\sqrt{n+1}}$$

**Question 2** Determine whether each of the following series is absolutely convergent, conditionally convergence or divergent. (Justify your answer)

a) $\sum_{n=3}^{\infty} \dfrac{e^n}{n!} \sin(n\pi/12)$

b) $\sum_{n=2}^{\infty} \dfrac{\cos(n\pi) + \sin(n\pi)}{\sqrt{n} - 1}$

**Question 3** Find the sum of the following series

$$\sum_{n=0}^{\infty} \left( \frac{2}{3^n} + \frac{5}{(2n+1)(4n+6)} \right)$$

**Question 4** Determine if the sequence $\{(n-1)\ln(n) - \ln(n-1)^{n-1}\}_{n=2}^{\infty}$ is convergence or divergent.