King Fahd University of Petroleum and Minerals

Quiz: 5 Math 102 Semester: 132 Duration: 45 minutes

Full Name: ID: Serial Number:

Question 1 Determine if the following sequences are convergent or divergent. Justify your answer.

a) $\left\{\cos(n\pi)\left(\dfrac{n}{n+\ln n}\right)\right\}_{n=1}^{\infty}$

b) $\left\{\dfrac{2-\cos n}{\ln n}\right\}_{n=2}^{\infty}$

Question 2 Find the sum of the following series:

$a) \sum_{n=1}^{\infty} \frac{3^{n-1} + \sin(n\pi)}{2^{2n+1}}$

$b) \ \frac{1}{(3)(5)} + \frac{1}{(4)(6)} + \frac{1}{(5)(7)} + \cdots$

Question 3 Test the following series for convergence or divergence. Justify your answer.

$a) \sum_{n=2}^{\infty} \frac{1}{\sqrt{n}\,(\ln n)}$

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

c) $\displaystyle\sum_{n=1}^{\infty} \left(\sqrt[n]{2} - \frac{\sin 3}{\csc 3} \right)^n$

d) $\displaystyle\sum_{n=2}^{\infty} \frac{1}{n \ln n}$

e) $\displaystyle\sum_{n=1}^{\infty} (-1)^n \frac{\cos n}{n^2}$