

NAME:

STUDENT NO:

**Q-3)** Find the sum

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

**Solution:**

$$\frac{6}{(n-1)(n)(n+2)} = \frac{-3}{n} + \frac{2}{n-1} + \frac{1}{n+2}.$$

Adding these from  $n = 2$  to  $n = k$  we find

$$s_k = \sum_{n=2}^k \frac{6}{(n-1)(n)(n+2)} = \frac{7}{6} - \frac{4+3k}{k(k+1)(k+2)}.$$

Hence the sum is  $\lim_{k \rightarrow \infty} s_k = \frac{7}{6}$ .