

14.6

(c)

There is no value of z such that $e^{\frac{1}{z}} = 0$ therefore there are no zeros.

The function obviously has a singularity at $z = 0$

Now look at Taylor expansion of $e^{\xi} = \sum_{n=0}^{\infty} \frac{1}{n!} \xi^n$

Therefore $e^{\frac{1}{z}} = \sum_{n=0}^{\infty} \frac{1}{n!} \left(\frac{1}{z} \right)^n$

Look at $\lim_{z \rightarrow 0} (z-0)^m \sum_{n=0}^{\infty} \frac{1}{n!} \left(\frac{1}{z} \right)^n$

There is no largest m such that this quantity is finite
therefore this is an essential singularity