Q9)

The 8284 clock generator is an essential component in an 8086-based system for several reasons:

1. Clock Generation: The 8284 generates the clock signal for the 8086 microprocessor. The 8086 requires a precise and stable clock signal for its operation. The 8284 generates the clock signal based on an external crystal oscillator or clock input and provides a stable clock signal to the 8086.
2. Bus Buffering: The 8284 provides bus buffering for the address and data buses. It ensures that the signals on the address and data buses are not corrupted due to multiple devices connected to them. The 8284 also provides current limiting and voltage translation for the address and data buses.
3. Power-on Reset: The 8284 provides a power-on reset signal to the 8086. This signal ensures that the 8086 starts up in a known state after power is applied. The power-on reset signal keeps the 8086 in reset until the 8284 has stabilized and the clock signal is valid.
4. READY Signal Generation: The 8284 generates the READY signal for the 8086. The READY signal indicates to the 8086 that the memory or I/O device is ready to receive or transfer data. The 8284 ensures that the READY signal is synchronized with the clock signal and provides the necessary timing for the 8086.

In summary, the 8284 clock generator is needed in an 8086-based system for clock generation, bus buffering, power-on reset, and READY signal generation. It ensures that the 8086 operates correctly and communicates with external devices in a reliable and stable manner.