This routine cleans up all MPI state. Each process must call MPI_FINALIZE before it exits. Unless there has been a call to MPI_ABORT, each process must ensure that all pending nonblocking communications are (locally) complete before calling MPI_FINALIZE. Further, at the instant at which the last process calls MPI_FINALIZE, all pending sends must be matched by a receive, and all pending receives must be matched by a send.

For example, the following program is correct:

```
Process 0                Process 1
---------                ---------
MPI_Init();              MPI_Init();
MPI_Send(dest=1);        MPI_Recv(src=0);
MPI_Finalize();          MPI_Finalize();
```

Without the matching receive, the program is erroneous:

```
Process 0                Process 1
-----------              -----------
MPI_Init();              MPI_Init();
MPI_Send (dest=1);
MPI_Finalize();          MPI_Finalize();
```

A successful return from a blocking communication operation or from MPI_WAIT or MPI_TEST tells the user that the buffer can be reused and means that the communication is completed by the user, but does not guarantee that the local process has no more work to do. A successful return from MPI_REQUEST_FREE with a request handle generated by an MPI_ISEND nullifies the handle but provides no assurance of operation completion. The MPI_ISEND is complete only when it is known by some means that a matching receive has completed. MPI_FINALIZE guarantees that all local actions required by communications the user has completed will, in fact, occur before it returns.

MPI_FINALIZE guarantees nothing about pending communications that have not been completed (completion is assured only by MPI_WAIT, MPI_TEST, or MPI_REQUEST_FREE combined with some other verification of completion).

Example 8.3 This program is correct:

```
rank 0                           rank 1
=================================================
...                              ...
MPI_Isend();                     MPI_Recv();
MPI_Request_free();              MPI_Barrier();
MPI_Barrier();                   MPI_Finalize();
MPI_Finalize();                  exit();
exit();
```

Example 8.4 This program is erroneous and its behavior is undefined:

```
rank 0                           rank 1
=================================================
...                              ...
MPI_Isend();                     MPI_Recv();
```