In [1]:

```
import matplotlib.pyplot as plt
import numpy as np
```

Будем производить запуск при P = 1,2,4,8,16 при $N = 10000000$ и $m = 40000$ и фиксировать время работы.

0.940199 0.550486 10000000 40000 1

0.511960 0.527244 10000000 40000 2

0.358202 0.527970 10000000 40000 4

0.293414 0.522651 10000000 40000 8

0.296473 0.527501 10000000 40000 16

In [3]:

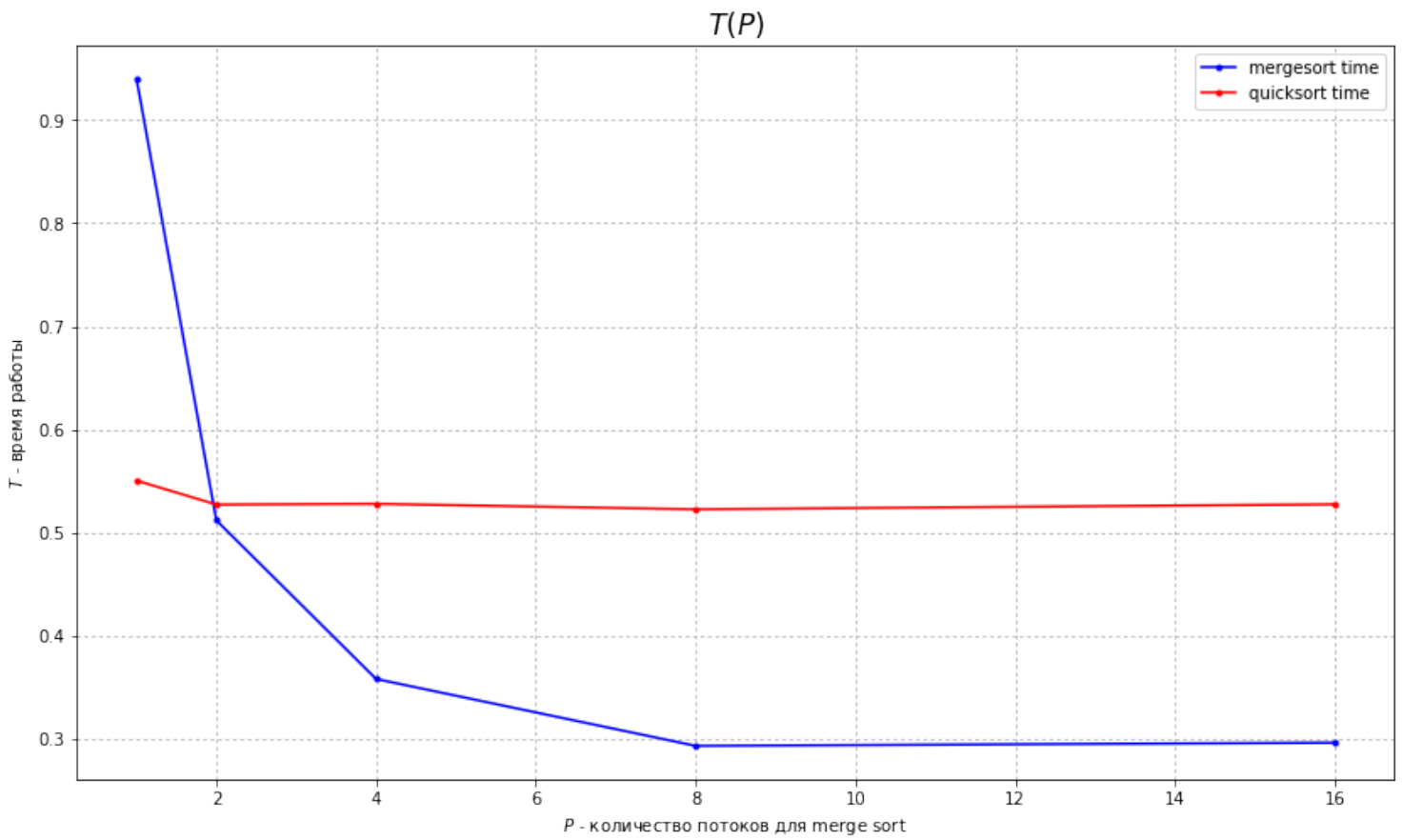
```
P = np.array([1, 2, 4, 8, 16])
time_p_merge_sort = np.array([0.940199, 0.511960, 0.358202, 0.293414, 0.296473
])
time_quicksort = np.array([0.550486, 0.527244, 0.527970, 0.522651, 0.527501])
```

График зависимости $T(P)$:

In [5]:

```
plt.figure(figsize=(14, 8))
plt.xlabel('$P$ - количество потоков для merge sort')
plt.ylabel('$T$ - время работы')
plt.title('$T(P)$', size = 17)
plt.grid(ls=':')

plt.plot(P, time_p_merge_sort, '.-', label = 'mergesort time', color = 'blue')
plt.plot(P, time_quicksort, '.-', label = 'quicksort time', color = 'red')
plt.legend()
plt.show()
```



In [6]:

```
S = time_p_merge_sort[0] / time_p_merge_sort
E = S / P
```

График зависимости $S(P)$:

In [8]:

```
plt.figure(figsize=(14, 8))
plt.xlabel('P - количество потоков')
plt.ylabel('S - ускорение')
plt.title('S(P)', size = 17)
plt.grid(ls=':')

plt.plot(P, S, '.-', label = 'S', color = 'blue')
plt.legend()
plt.show()
```

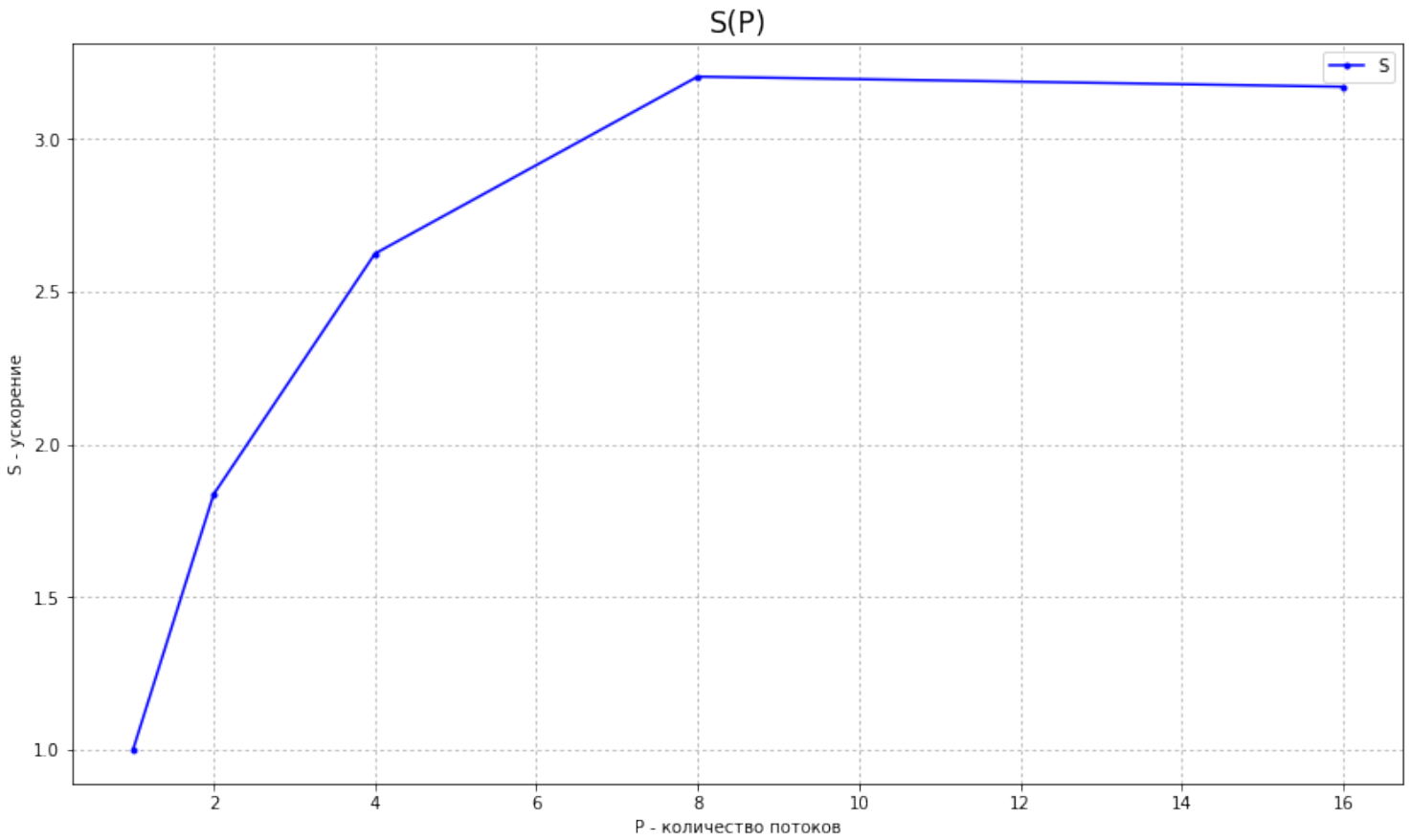
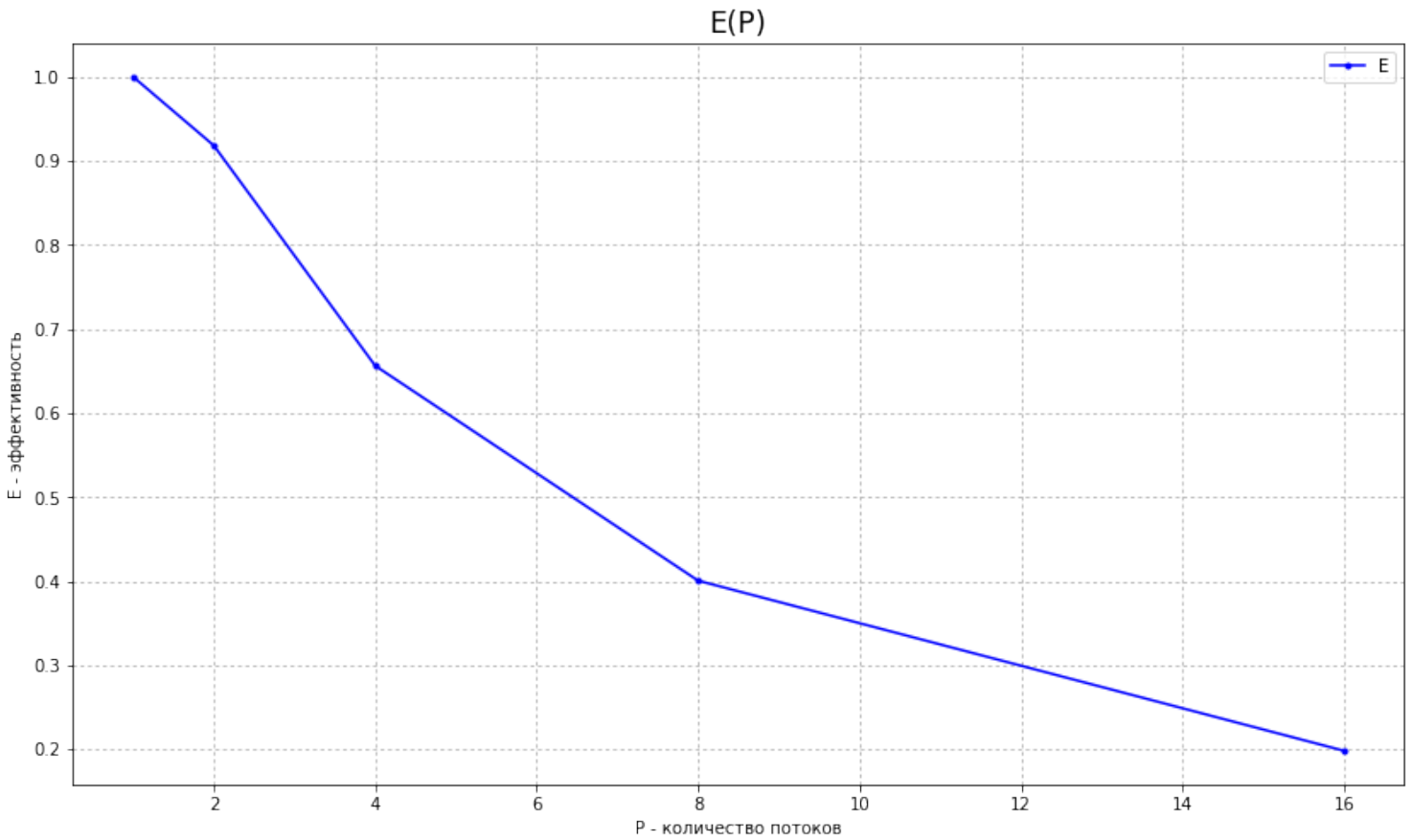


График зависимости $E(P)$:

In [10]:

```
plt.figure(figsize=(14, 8))
plt.xlabel('P - количество потоков')
plt.ylabel('E - эффективность')
plt.title('E(P)', size = 17)
plt.grid(ls=':')

plt.plot(P, E, '.-', label = 'E', color = 'blue')
plt.legend()
plt.show()
```



In [ ]:

```
```