Part 1. Arrays and shapes

Let A be a numpy array of shape (4,5). What is the shape of a.transpose()[:, 1]?

(A) (5,)
(B) ()
(C) (5,1)
(D) (4,1)
(E) (4,)

Part 2. Numpy indexing

Write a piece of code that produces a 10 × 10 version of the following array having a dtype of float32 in the variable a

```
0 1 2 3
0 1 2 3
0 0 0 0
0 1 2 3
```

(The row of zeros stays in the third row.)

Do not use any for loops.

```python
import numpy as np
```
Part 3. Numpy indexing

Write a piece of code that produces a $10 \times 10$ multiplication table in the variable `mult_table`:

\[
\begin{array}{cccc}
0 & 0 & 0 & 0 \\
0 & 1 & 2 & 3 \\
0 & 2 & 4 & 6 \\
0 & 3 & 6 & 9 \\
\end{array}
\]

Do not use any for loops.

```python
import numpy as np
```