```python
In [1]: import numpy as np
```

```python
In [2]: import matplotlib.pyplot as plt
```

```python
In [3]: %matplotlib inline
```

```python
In [4]: from PIL import Image
```

```python
In [5]: horse_image=Image.open(r"C:\Users\Admin\Downloads\horse-nature-generate-image.jp
```

```python
In [6]: horse_image
```

Out[6]:


```python
In [7]: type(horse_image)
```

Out[7]:   PIL.JpegImagePlugin.JpegImageFile

```python
In [8]: horse_arr=np.asarray(horse_image) #converting image to array
```

```python
In [9]: horse_arr
```

```
Out[9]:  array([[[251, 232, 199],
                 [248, 228, 193],
                 [243, 223, 186],
                 ...,
                 [237, 218, 186],
                 [239, 219, 186],
                 [240, 220, 187]],

                [[253, 235, 199],
                 [249, 231, 195],
                 [245, 225, 190],
                 ...,
                 [237, 218, 186],
                 [238, 219, 187],
                 [239, 219, 186]],

                [[254, 236, 198],
                 [251, 233, 195],
                 [247, 229, 193],
                 ...,
                 [235, 218, 188],
                 [235, 219, 186],
                 [238, 219, 187]],

                ...,

                [[ 39,  34,  28],
                 [ 37,  34,  29],
                 [ 36,  33,  28],
                 ...,
                 [ 48,  35,  18],
                 [ 56,  39,  23],
                 [ 58,  40,  26]],

                [[ 38,  33,  29],
                 [ 38,  33,  29],
                 [ 38,  33,  29],
                 ...,
                 [ 47,  34,  18],
                 [ 52,  39,  23],
                 [ 54,  41,  25]],

                [[ 38,  33,  30],
                 [ 39,  34,  31],
                 [ 39,  34,  31],
                 ...,
                 [ 49,  35,  22],
                 [ 51,  39,  25],
                 [ 51,  39,  25]]], dtype=uint8)
```
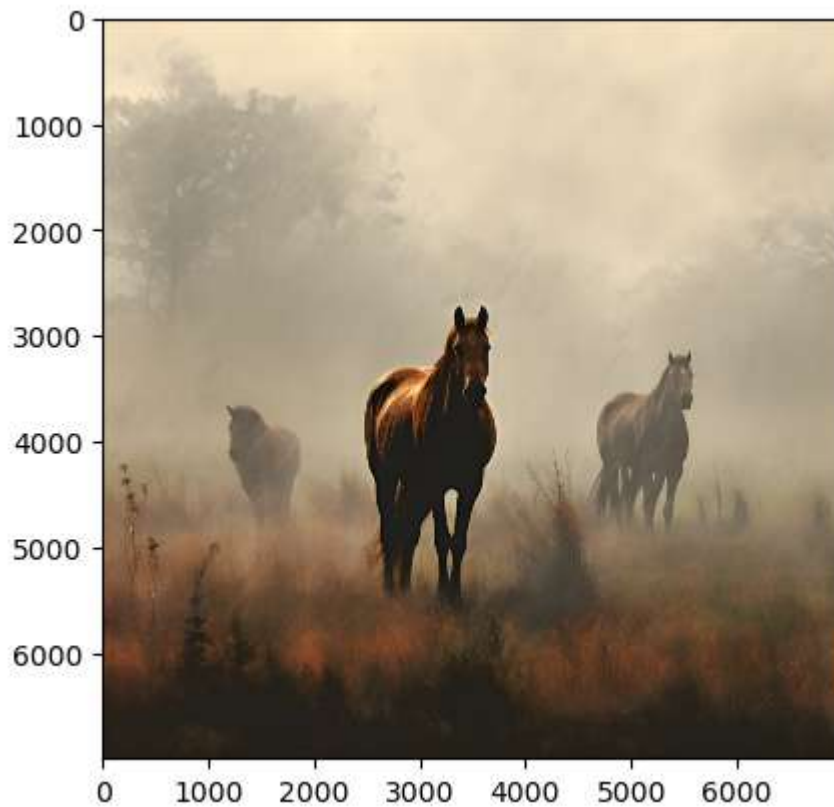
```
In [10]:  horse_arr.ndim
```

```
Out[10]:  3
```

```
In [11]:  type(horse_arr)
```
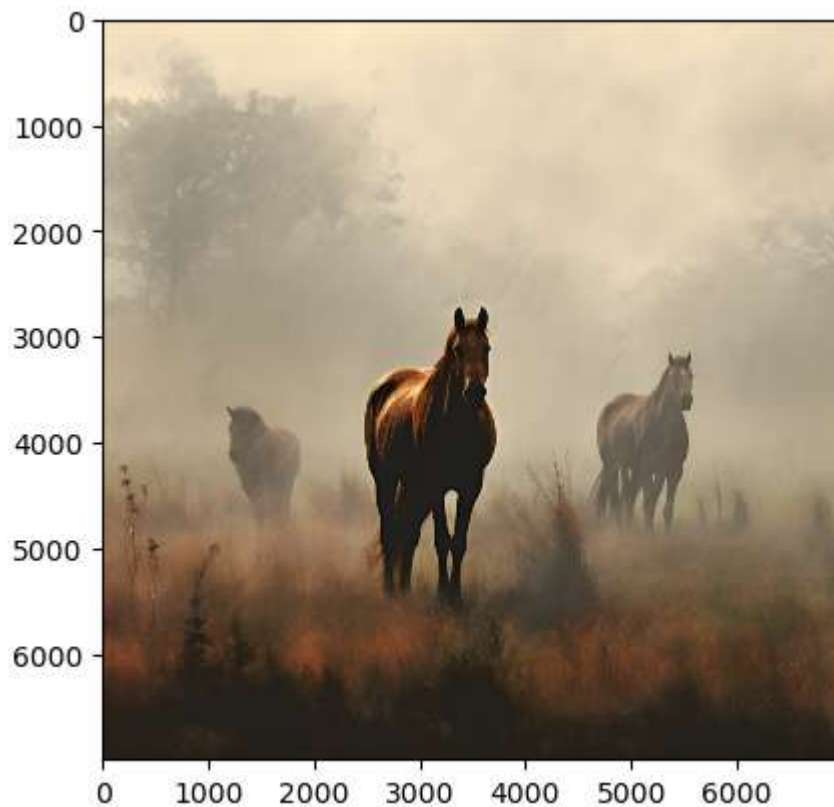
```
Out[11]:  numpy.ndarray
```

```
In [12]:  plt.imshow(horse_image) #visualizing the image in the graph
```

Out[12]:   <matplotlib.image.AxesImage at 0x1ec429b0b60>

In [13]: `plt.imshow(horse_arr)`

Out[13]:   <matplotlib.image.AxesImage at 0x1ec48947f50>

In [14]: `horse_arr.shape`

Out[14]: (7000, 7000, 3)

```
In [15]:  horse_arr.ndim

Out[15]:  3

In [16]:  horse_red=horse_arr.copy() #copying the array to new variable

In [17]:  horse_red
```

```
Out[17]:  array([[[251, 232, 199],
                 [248, 228, 193],
                 [243, 223, 186],
                 ...,
                 [237, 218, 186],
                 [239, 219, 186],
                 [240, 220, 187]],

                [[253, 235, 199],
                 [249, 231, 195],
                 [245, 225, 190],
                 ...,
                 [237, 218, 186],
                 [238, 219, 187],
                 [239, 219, 186]],

                [[254, 236, 198],
                 [251, 233, 195],
                 [247, 229, 193],
                 ...,
                 [235, 218, 188],
                 [235, 219, 186],
                 [238, 219, 187]],

                ...,

                [[ 39,  34,  28],
                 [ 37,  34,  29],
                 [ 36,  33,  28],
                 ...,
                 [ 48,  35,  18],
                 [ 56,  39,  23],
                 [ 58,  40,  26]],

                [[ 38,  33,  29],
                 [ 38,  33,  29],
                 [ 38,  33,  29],
                 ...,
                 [ 47,  34,  18],
                 [ 52,  39,  23],
                 [ 54,  41,  25]],

                [[ 38,  33,  30],
                 [ 39,  34,  31],
                 [ 39,  34,  31],
                 ...,
                 [ 49,  35,  22],
                 [ 51,  39,  25],
                 [ 51,  39,  25]]], dtype=uint8)
```

In [18]: `horse_arr==horse_red`

Out[18]:
```
array([[[ True,   True,   True],
        [ True,   True,   True],
        [ True,   True,   True],
        ...,
        [ True,   True,   True],
        [ True,   True,   True],
        [ True,   True,   True]],

       [[ True,   True,   True],
        [ True,   True,   True],
        [ True,   True,   True],
        ...,
        [ True,   True,   True],
        [ True,   True,   True],
        [ True,   True,   True]],

       [[ True,   True,   True],
        [ True,   True,   True],
        [ True,   True,   True],
        ...,
        [ True,   True,   True],
        [ True,   True,   True],
        [ True,   True,   True]],

       ...,

       [[ True,   True,   True],
        [ True,   True,   True],
        [ True,   True,   True],
        ...,
        [ True,   True,   True],
        [ True,   True,   True],
        [ True,   True,   True]],

       [[ True,   True,   True],
        [ True,   True,   True],
        [ True,   True,   True],
        ...,
        [ True,   True,   True],
        [ True,   True,   True],
        [ True,   True,   True]],

       [[ True,   True,   True],
        [ True,   True,   True],
        [ True,   True,   True],
        ...,
        [ True,   True,   True],
        [ True,   True,   True],
        [ True,   True,   True]]])
```
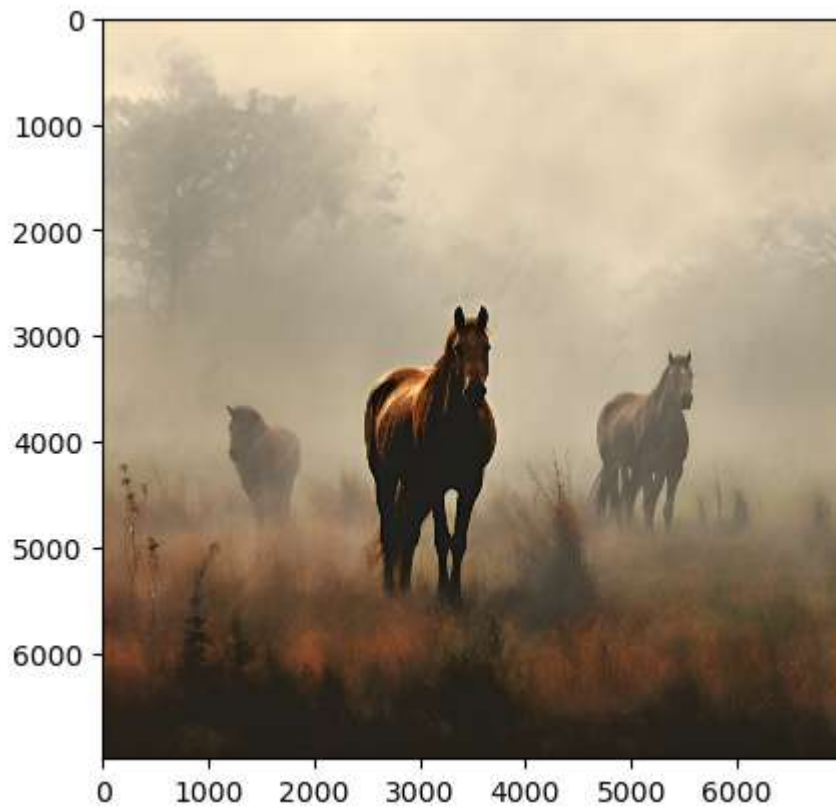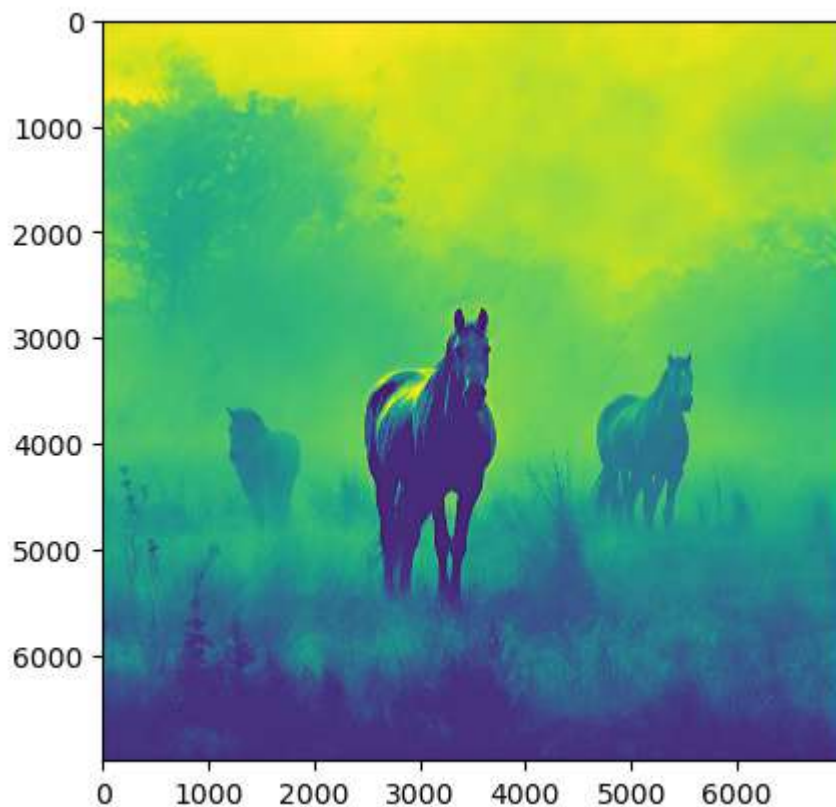
In [19]: `plt.imshow(horse_red)`

Out[19]: `<matplotlib.image.AxesImage at 0x1ec489af650>`

In [20]: `horse_red.shape`

Out[20]: `(7000, 7000, 3)`

In [21]: `plt.imshow(horse_red[:,:,0])`
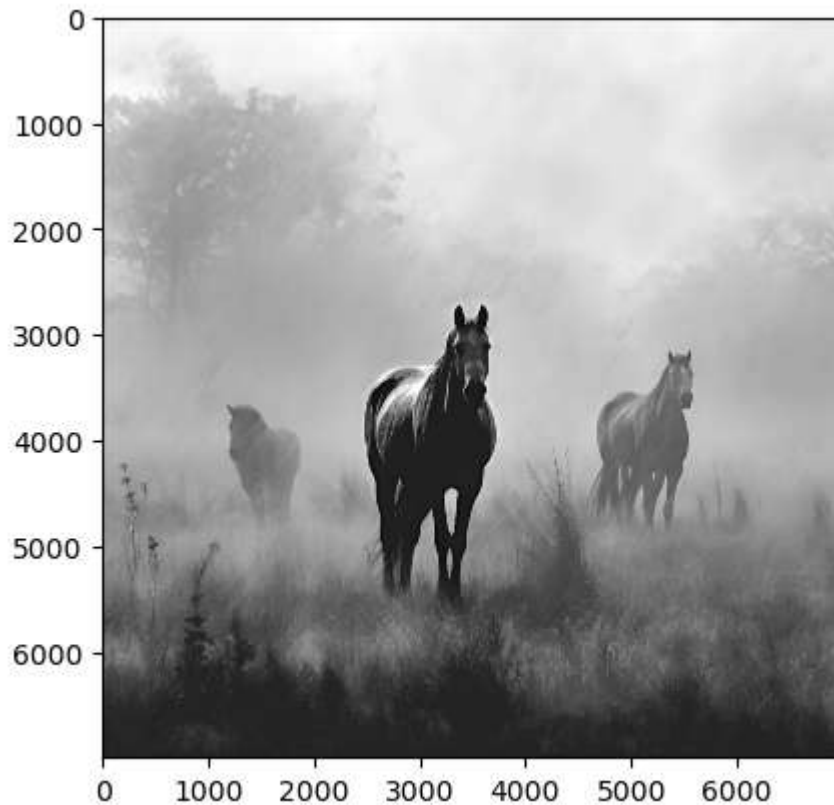
Out[21]: `<matplotlib.image.AxesImage at 0x1ec00052ab0>`

In [22]: `horse_red[:,:0]`

Out[22]: `array([], shape=(7000, 0, 3), dtype=uint8)`
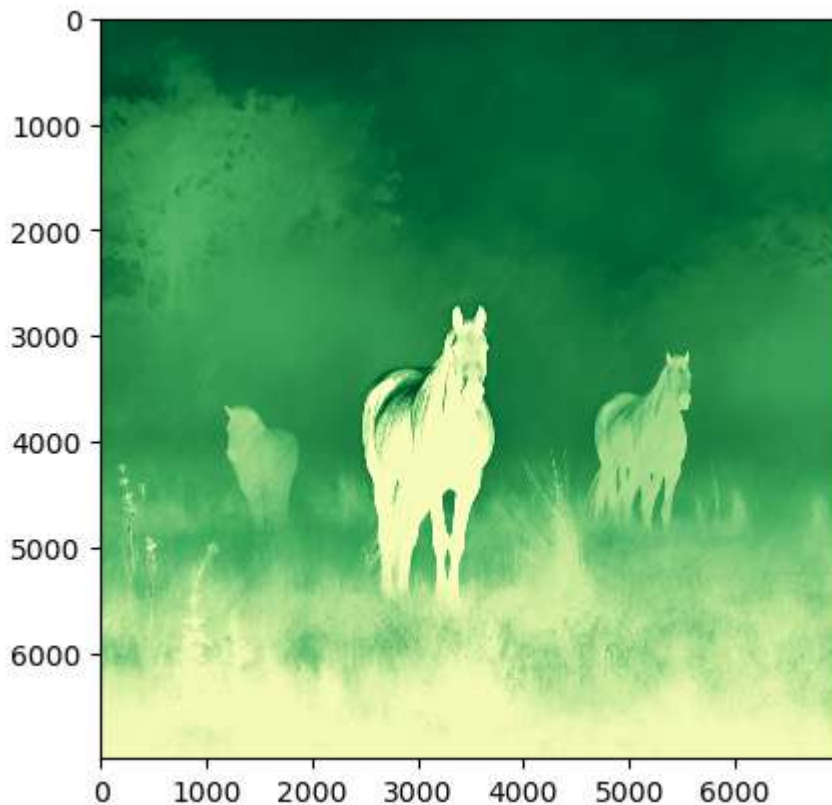
In [23]: `plt.imshow(horse_red[:,:,0],cmap='grey')`

Out[23]: `<matplotlib.image.AxesImage at 0x1ec000c8800>`

In [24]: `plt.imshow(horse_red[:,:,0],cmap='YlGn')`

Out[24]: `<matplotlib.image.AxesImage at 0x1ec267e5400>`

In [25]: `horse_red[:,:,0]`

Out[25]:
```
array([[251, 248, 243, ..., 237, 239, 240],
       [253, 249, 245, ..., 237, 238, 239],
       [254, 251, 247, ..., 235, 235, 238],
       ...,
       [ 39,  37,  36, ...,  48,  56,  58],
       [ 38,  38,  38, ...,  47,  52,  54],
       [ 38,  39,  39, ...,  49,  51,  51]], dtype=uint8)
```

In [26]: `horse_red[:,:,1]`

Out[26]:
```
array([[232, 228, 223, ..., 218, 219, 220],
       [235, 231, 225, ..., 218, 219, 219],
       [236, 233, 229, ..., 218, 219, 219],
       ...,
       [ 34,  34,  33, ...,  35,  39,  40],
       [ 33,  33,  33, ...,  34,  39,  41],
       [ 33,  34,  34, ...,  35,  39,  39]], dtype=uint8)
```

In [27]: `horse_red[:,:,2]`

Out[27]:
```
array([[199, 193, 186, ..., 186, 186, 187],
       [199, 195, 190, ..., 186, 187, 186],
       [198, 195, 193, ..., 188, 186, 187],
       ...,
       [ 28,  29,  28, ...,  18,  23,  26],
       [ 29,  29,  29, ...,  18,  23,  25],
       [ 30,  31,  31, ...,  22,  25,  25]], dtype=uint8)
```

In [28]: `horse_red[:,:,1]=0 #rewriting the selected pixel values in the array to 0`
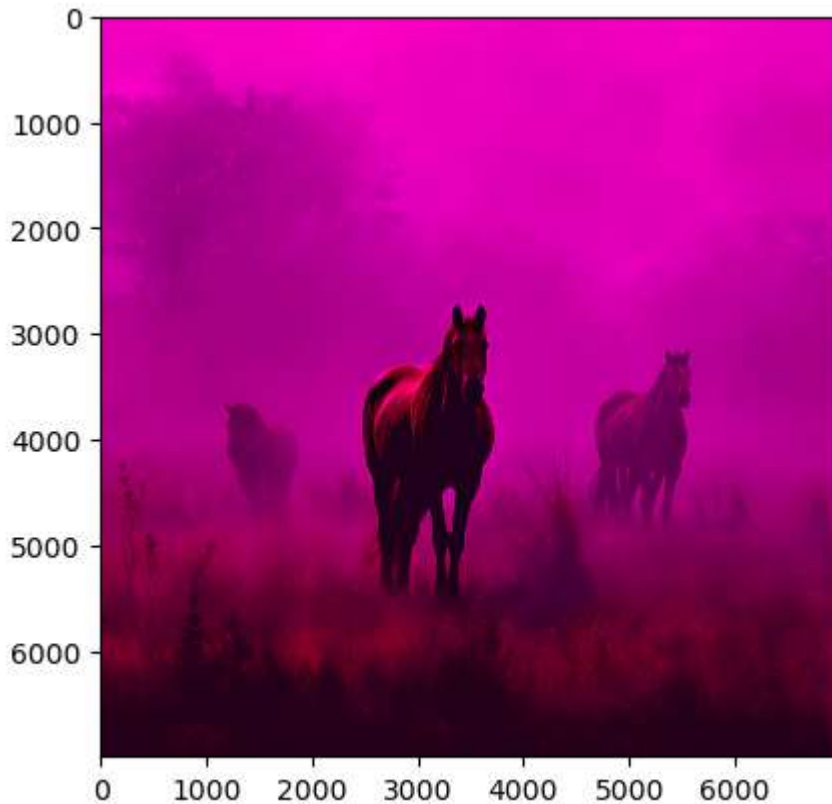
In [29]: `horse_red[:,:,1]`

```
Out[29]:  array([[0, 0, 0, ..., 0, 0, 0],
                 [0, 0, 0, ..., 0, 0, 0],
                 [0, 0, 0, ..., 0, 0, 0],
                 ...,
                 [0, 0, 0, ..., 0, 0, 0],
                 [0, 0, 0, ..., 0, 0, 0],
                 [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

```
In [30]:  plt.imshow(horse_red)
```

```
Out[30]:  <matplotlib.image.AxesImage at 0x1ec2686ad50>
```



```
In [31]:  horse_red[:,:,2]
```

```
Out[31]:  array([[199, 193, 186, ..., 186, 186, 187],
                 [199, 195, 190, ..., 186, 187, 186],
                 [198, 195, 193, ..., 188, 186, 187],
                 ...,
                 [ 28,  29,  28, ...,  18,  23,  26],
                 [ 29,  29,  29, ...,  18,  23,  25],
                 [ 30,  31,  31, ...,  22,  25,  25]], dtype=uint8)
```

```
In [32]:  horse_red[:,:,2]=0
```

```
In [33]:  horse_red[:,:,2]
```

```
Out[33]:  array([[0, 0, 0, ..., 0, 0, 0],
                 [0, 0, 0, ..., 0, 0, 0],
                 [0, 0, 0, ..., 0, 0, 0],
                 ...,
                 [0, 0, 0, ..., 0, 0, 0],
                 [0, 0, 0, ..., 0, 0, 0],
                 [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

In [34]: `plt.imshow(horse_red)`

Out[34]: `<matplotlib.image.AxesImage at 0x1ec2c671880>`
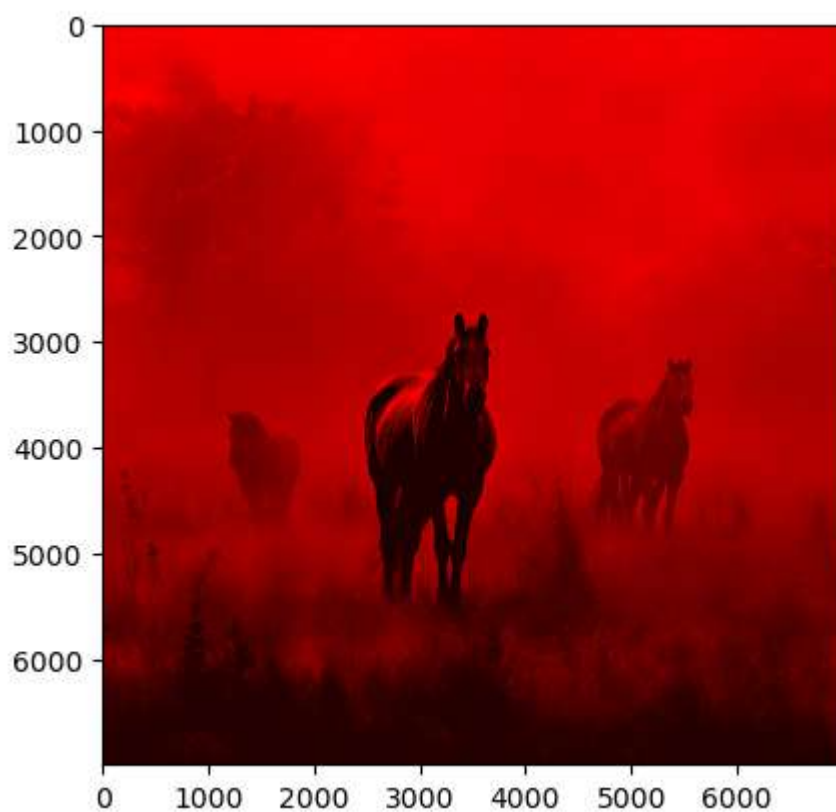
In [35]: `horse_image`

Out[35]:

In [36]: `horse_red`

```
Out[36]:  array([[[251,    0,    0],
                  [248,    0,    0],
                  [243,    0,    0],
                  ...,
                  [237,    0,    0],
                  [239,    0,    0],
                  [240,    0,    0]],

                 [[253,    0,    0],
                  [249,    0,    0],
                  [245,    0,    0],
                  ...,
                  [237,    0,    0],
                  [238,    0,    0],
                  [239,    0,    0]],

                 [[254,    0,    0],
                  [251,    0,    0],
                  [247,    0,    0],
                  ...,
                  [235,    0,    0],
                  [235,    0,    0],
                  [238,    0,    0]],

                 ...,

                 [[ 39,    0,    0],
                  [ 37,    0,    0],
                  [ 36,    0,    0],
                  ...,
                  [ 48,    0,    0],
                  [ 56,    0,    0],
                  [ 58,    0,    0]],

                 [[ 38,    0,    0],
                  [ 38,    0,    0],
                  [ 38,    0,    0],
                  ...,
                  [ 47,    0,    0],
                  [ 52,    0,    0],
                  [ 54,    0,    0]],

                 [[ 38,    0,    0],
                  [ 39,    0,    0],
                  [ 39,    0,    0],
                  ...,
                  [ 49,    0,    0],
                  [ 51,    0,    0],
                  [ 51,    0,    0]]], dtype=uint8)
```

```
In [37]:  horse_arr
```

```
Out[37]:  array([[[251, 232, 199],
                  [248, 228, 193],
                  [243, 223, 186],
                  ...,
                  [237, 218, 186],
                  [239, 219, 186],
                  [240, 220, 187]],

                 [[253, 235, 199],
                  [249, 231, 195],
                  [245, 225, 190],
                  ...,
                  [237, 218, 186],
                  [238, 219, 187],
                  [239, 219, 186]],

                 [[254, 236, 198],
                  [251, 233, 195],
                  [247, 229, 193],
                  ...,
                  [235, 218, 188],
                  [235, 219, 186],
                  [238, 219, 187]],

                 ...,

                 [[ 39,  34,  28],
                  [ 37,  34,  29],
                  [ 36,  33,  28],
                  ...,
                  [ 48,  35,  18],
                  [ 56,  39,  23],
                  [ 58,  40,  26]],

                 [[ 38,  33,  29],
                  [ 38,  33,  29],
                  [ 38,  33,  29],
                  ...,
                  [ 47,  34,  18],
                  [ 52,  39,  23],
                  [ 54,  41,  25]],

                 [[ 38,  33,  30],
                  [ 39,  34,  31],
                  [ 39,  34,  31],
                  ...,
                  [ 49,  35,  22],
                  [ 51,  39,  25],
                  [ 51,  39,  25]]], dtype=uint8)
```

```
In [38]:  arr1=np.asarray(horse_image)
```

```
In [39]:  arr1
```

```
Out[39]: array([[[251, 232, 199],
                 [248, 228, 193],
                 [243, 223, 186],
                 ...,
                 [237, 218, 186],
                 [239, 219, 186],
                 [240, 220, 187]],

                [[253, 235, 199],
                 [249, 231, 195],
                 [245, 225, 190],
                 ...,
                 [237, 218, 186],
                 [238, 219, 187],
                 [239, 219, 186]],

                [[254, 236, 198],
                 [251, 233, 195],
                 [247, 229, 193],
                 ...,
                 [235, 218, 188],
                 [235, 219, 186],
                 [238, 219, 187]],

                ...,

                [[ 39,  34,  28],
                 [ 37,  34,  29],
                 [ 36,  33,  28],
                 ...,
                 [ 48,  35,  18],
                 [ 56,  39,  23],
                 [ 58,  40,  26]],

                [[ 38,  33,  29],
                 [ 38,  33,  29],
                 [ 38,  33,  29],
                 ...,
                 [ 47,  34,  18],
                 [ 52,  39,  23],
                 [ 54,  41,  25]],

                [[ 38,  33,  30],
                 [ 39,  34,  31],
                 [ 39,  34,  31],
                 ...,
                 [ 49,  35,  22],
                 [ 51,  39,  25],
                 [ 51,  39,  25]]], dtype=uint8)
```
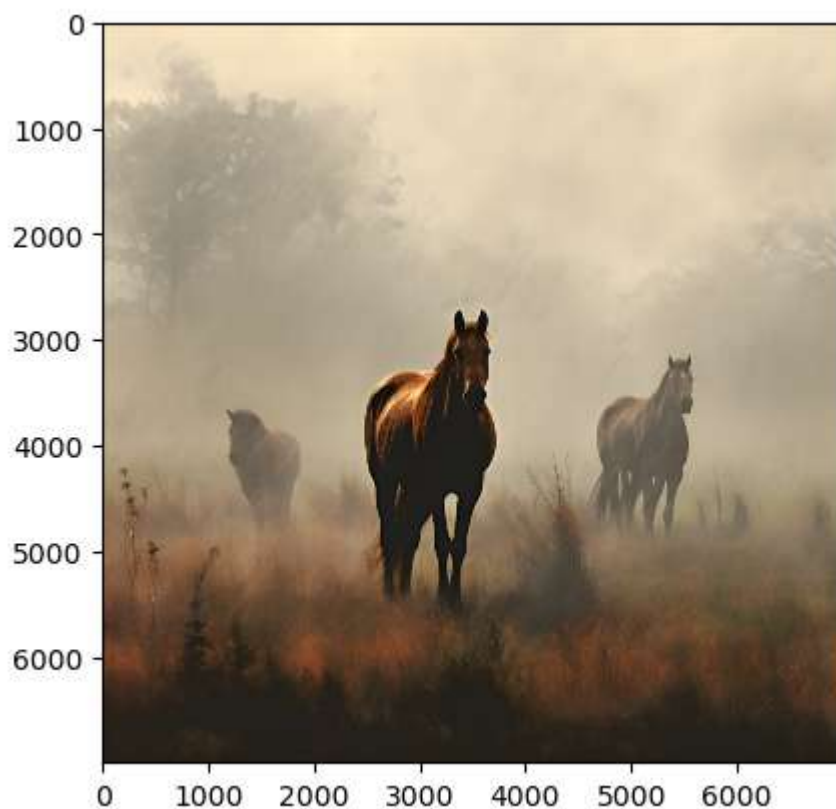
```
In [40]: type(arr1)
```

```
Out[40]: numpy.ndarray
```

```
In [41]: np.shape(arr1)
```

```
Out[41]: (7000, 7000, 3)
```

```
In [42]: plt.imshow(arr1)
```

Out[42]:   <matplotlib.image.AxesImage at 0x1ec2c6e18e0>
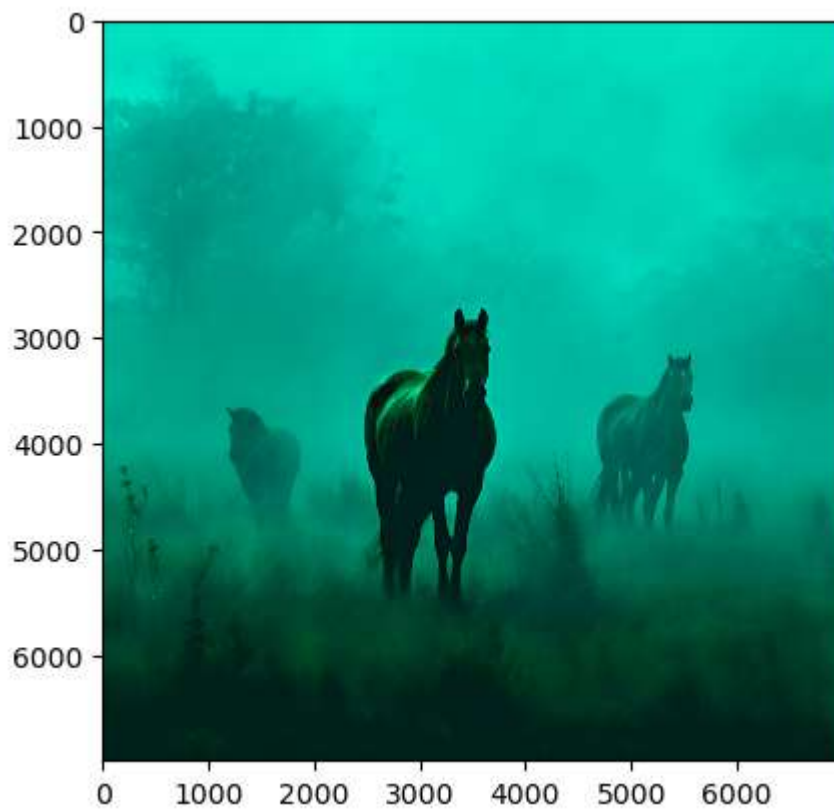

In [43]:   horse_image1=arr1.copy()

In [44]:   horse_image1[:,:,0]

Out[44]:   array([[251, 248, 243, ..., 237, 239, 240],
                   [253, 249, 245, ..., 237, 238, 239],
                   [254, 251, 247, ..., 235, 235, 238],
                   ...,
                   [39, 37, 36, ..., 48, 56, 58],
                   [38, 38, 38, ..., 47, 52, 54],
                   [38, 39, 39, ..., 49, 51, 51]], dtype=uint8)

In [45]:   horse_image1[:,:,0]=0
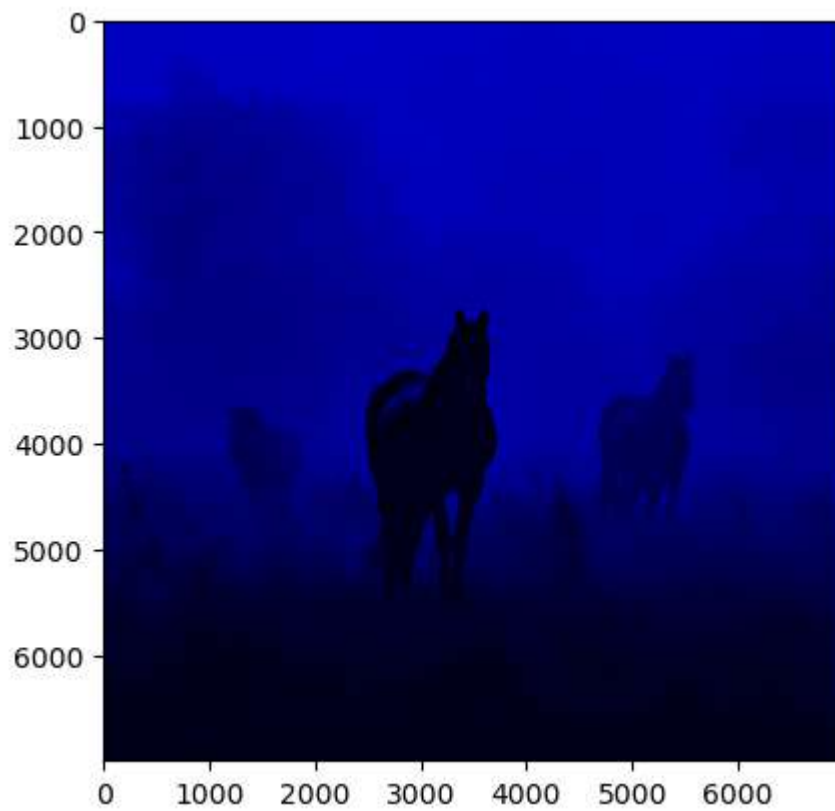
In [46]:   plt.imshow(horse_image1)

Out[46]:   <matplotlib.image.AxesImage at 0x1ec354cd9d0>

In [47]: `horse_image1[:,:,1]`

Out[47]:
```
array([[232, 228, 223, ..., 218, 219, 220],
       [235, 231, 225, ..., 218, 219, 219],
       [236, 233, 229, ..., 218, 219, 219],
       ...,
       [ 34,  34,  33, ...,  35,  39,  40],
       [ 33,  33,  33, ...,  34,  39,  41],
       [ 33,  34,  34, ...,  35,  39,  39]], dtype=uint8)
```

In [48]: `horse_image1[:,:,1]=0`

In [49]: `plt.imshow(horse_image1)`

Out[49]: `<matplotlib.image.AxesImage at 0x1ec488f4aa0>`

In [ ]: