

Name & Student Id: _____

MAS2011 Introduction to Visual Media Programming 2022-
02 Final Exam (10 problems in 2 pages)

Put your solution on the right side of this paper.

1. Provide a definition of a python class Block, a subclass of Sprite, having a red colored rectangle of size (40, 30).

2. Provide python code below to finish making a function to detect collision between two rectangles. The function must return True or Fa.

```
def collision_check(Rect a, Rect b):
```

3. Define a class named Circle, which is a derived class of Sprite so that it can be used along with pygame.sprite.Group.

4. Now make a collision detection function given two Circle objects:

```
def collision_check_circle(Circle a, Circle b):
```

5. Calculate (1) vector addition and (2) inner product of two vectors: $a=[1, 2, 3]$ $b=[4, 5, 6]$.

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6. Given an image, you are going to put some motion blur effect on the image. By what method can you do it? Explain your method in detail.

7. You want to increase the contrast of an image. Explain the concept of contrast and how to increase it based on histogram analysis.

8. Explain two color spaces, RGB and HSV. What are common, what are different, and why do you need both, etc.

9. Given is a video containing a football playing. Propose a method to discard pixels of ground field and extract player blobs.

10. Compute the convolution of the following two 1D signals

$$A = [1, 1, 1, 1, 2, 2, 2, 2]$$

$$B = [1, -1]$$