****



|  |  |
| --- | --- |
| **Name:** Saher Muhamed | **Date:** 20/01/2025 |
| **University:** Benha University | **Faculty:** Faculty of Computers & Artificial Intelligence |
| **Term:** 1st Term | **Subject Title:** Computer Vision |
| **Exam Type**: Final Exam | **Total Marks:** 50 Marks |
| **Department:** Artificial Intelligence | **Time:** 2 Hours |
| **Subject:** Computer Vision | **Examiner(s):** Dr. Ahmed Taha |

***Question 1*: Answer the following. Write your answers in the spaces provided.**

1. Find the perimeter of a rectangle with a length of 14 units and a width of 8 units.

|  |
| --- |
| The perimeter of the rectangle is 44 units. |

1. Calculate the area of a triangle with a base of 10 units and a height of 6 units.

|  |
| --- |
| The area of the triangle is 30 square units. |

1. Alice has twice as many apples as Bob. If Bob has 15 apples, how many apples does Alice have?

|  |
| --- |
| Alice has 30 apples. |

1. A train travels at a speed of 60 miles per hour. How far will it travel in 3 hours?

|  |  |
| --- | --- |
| Question 4 answering for test |  |

1. Convert 2.5 kilometers to meters.

|  |  |
| --- | --- |
| Question 5 answering for test |  |

1. If a box has dimensions of 5 cm by 10 cm by 3 cm, what is its volume?

|  |  |
| --- | --- |
| Question 6 answering for test |  |

1. Given the data set: 10, 15, 20, 25, and 30, find the mean.

|  |  |
| --- | --- |
| Question 7 answering for test |  |

1. If the median of a set of numbers is 18, and there are 7 numbers in the set, what is the sum of all the numbers?

|  |  |
| --- | --- |
| Question 8 answering for test |  |

***Question 2:* True or False.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| T | T | F | T | F | T | T | F | F | T |

1. Photogrammetry is primarily concerned with accurate measurements from image. **[ ]**
2. Rod photoreceptors operate well in bright light conditions. **[ ]**
3. An image is a 2D projection of the 3D world. **[ ]**
4. Computer graphics maps from 3D models to images, while computer vision does the inverse. **[ ]**
5. The visual cortex makes up over 30% of the brain's neurons. **[ ]**
6. The primary visual cortex (V1) helps us recognize object sizes, colors, and shapes, while the secondary visual cortex (V2) concerns edge detection. **[ ]**
7. Ventral damage renders a person blind. However, even though they cannot consciously see or recognize objects, they can still walk around obstacles. **[ ]**
8. There are three types of cones: short, medium, and long, which correspond to short (blue), medium (green), and long (red) wavelengths. **[ ]**
9. Ganglia are responsible for transmitting visual information from the retina to the brain. **[ ]**
10. Eyespots in organisms like Euglena are capable of forming detailed images and recognizing objects. **[ ]**

***Question 3:* Choose the Correct Answer.**

1. What is the primary function of an optimizer in deep learning
   1. To define the structure of the neural network.
   2. To evaluate the model's performance.
   3. To adjust the parameters of the neural network and minimize the loss function.
   4. To pre-process the input data.
2. How does the length of the sequence affect training stability in RNNs?
   1. Longer sequences typically enhance the stability of gradient descent in RNNs.
   2. Longer sequences amplify the risk of vanishing and exploding gradients.
   3. Longer sequences lower the computational cost of training RNNs
   4. Longer sequences do not influence the stability of RNN training.
3. In an RNN, what role does the hidden state serve?
   1. To store the final output of the model.
   2. To retain the context from previous time steps and guide current predictions.
   3. To directly regulate the learning rate.
   4. To normalize input data before passing it to the next layer.
4. Which activation function is most likely to experience the "dying neuron" issue?
   1. Sigmoid
   2. Tanh
   3. Relu
   4. SoftMax
5. What is the key benefit of using LSTM or GRU units instead of standard RNNs when performing gradient descent?
   1. They have a more straightforward structure, making them easier to train.
   2. They prevent the vanishing gradient issue through gating mechanisms.
   3. They require fewer parameters to be trained.
   4. They can process longer sequences simultaneously.