**Question One: Choose the correct answer**  (8 Marks)

1. Which of the following statements is **TRUE** about the Computer Graphics?
   a. Computer graphics is the creation, collection, storage, manipulation and presentation of models and images of objects
   b. Psychology of light and color perception
   c. Mathematics of 2-D and 3-D geometry and image creation
   d. All of these

2. **Vector** graphics are composed of ___.
   a. Palette
   b. Paths
   c. Pixels
   d. None of these

3. The transformation in which objects are **stretch or shrink** in one direction is called ___.
   a. Translation
   b. Rotation
   c. Scaling
   d. Reflection

4. Which of the following geometric objects represented by a sequence of line where the following line starts where the previous one ends?
   a. Polyline
   b. Points.
   c. Polygon
   d. None of these

5. **Naïve line** drawing algorithm will fail in which of the following cases ___.
   a. a horizontal line where x₀ = x₁
   b. a vertical line where x₀ = x₁
   c. a vertical line where x₀ > x₁
   d. None of these

6. Which of the following **Java 2D classes** used for defining different line styles?
   a. BasicStroke
   b. AffineTransform
   c. Point2D
   d. TexturePaint

7. ____ is usually applied to test whether the point is interior or not.
   a. Scan line algorithm
   b. Flood-fill algorithm
   c. Midpoint algorithm
   d. Odd-parity algorithm

8. Which of the following statements is **FALSE** about the **Buffered Images**?
   a. A Buffered Image is an image in the memory which can be drawn on an Image.
   b. The constructor **BufferedImage** generates a Buffered Image.
   c. The method **drawImage** generates a Graphics2D object for the BufferedImage.
   d. None of these
Question Two: Answer Three(3) Questions  (9 Marks)

1. Describe the complexity of **Midpoint** line drawing algorithm and how **Structural algorithm**
   tries to reduce this complexity.
2. Explain in details the concept of **Scan line algorithm** for filling areas.
3. Differentiate between **moving pen** and **pixel replication** approaches for pixels thickness.
4. List the three parameters of the **HSV** color model.

Question Three:  (5 Marks)

1. Consider the following figure and find transformation matrix to translate the triangle joining the
   points (1,1), (4,1), and (3,3) by 4 in the x-direction and by -3 in the y-direction.

![Diagram](image)

Translation matrix

\[
T(d_x, d_y) = \begin{pmatrix}
1 & 0 & d_x \\
0 & 1 & d_y \\
0 & 0 & 1
\end{pmatrix}
\]

Question Four: Answer All Questions  (8 Marks)

1. Write the Java code to construct a circle of width 100 centered at (150, 200).
2. Write the Java code to draw a thick line (5 pixel) based on \{8, 5, 16, 5\} pattern.
3. Write the Java code to display the following text using **TextAttributes**
   and **AttributeString** classes.

   "**Computer Graphics** 1st Semester"

End of Questions

*Good Luck*