University of Asia Pacific
Department of Computer Science & Engineering
Mid-Semester Examination Spring -2019
Program: B. Sc Engineering (4ᵗʰ Year/1ˢᵗ Semester)
Course Title: Computer Graphics Course No. CSE-431 Credit: 3.00

Time: 1.00 Hour.   Full Mark: 60

There are **Four** Questions. Answer any **Three**. All questions are of equal value/Figures in the right margin indicate marks.

1. a) What is affine combination? State the properties of Barycentric coordinate. 10

   b) The point P(x, y) is coplanar to the triangle defined by three vertices A (2,2), B(3,4) and C(4,5). Calculate the coordinate of P(x, y) using Barycentric Coordinates if $\alpha=0.2$ and $\beta=0.3$. 10

2. a) What are the uses of Transformation in Computer Graphics? 5

   b) Rotate the following triangle ABC (coordinates of A, B, C are given in the fig. 1) with $\theta = -90°$ about a point P(2, 1). Find the matrices needed for the operation and the new coordinates of the triangle after the operation. 15

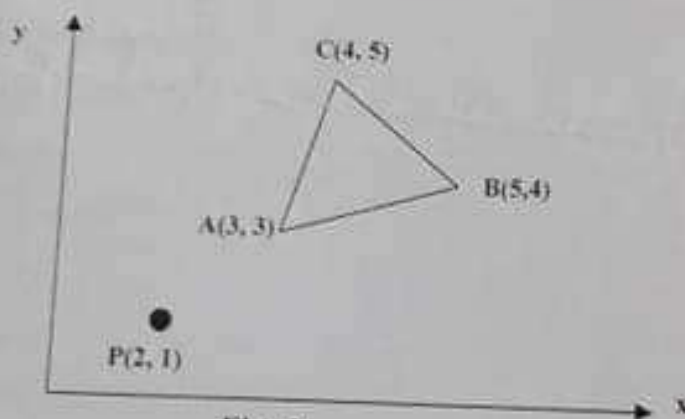

Fig. 1

3. a) Describe how a parabola can be drawn using affine combination of three points. 5

   b) Consider a point P (1, 2, -1) in 3D space. Find the new coordinate of the point after the following operations 15
      i) Translate the point with dx=2, dy=2 and dz=1/2
      ii) Rotate the point 45° about Y-axis.

4. a) Briefly explain the RGB color Model with necessary diagram. Why RGB is called as additive color model? 10

   b) With color conversion process convert the RGB coordinate of a color at (0.9, 1, 08) in HIS color space. 10