

I. 是非題(20%，每題 2 分)

1. A Bezier curve passes through all its control vertices.
2. RLE is the simplest lossy compression algorithm to understand, but it is far from the most effective.
3. Fractal algorithms can be used to model natural phenomena such as coastlines, mountains and the edges of clouds.
4. The fundamental obstacle to streamed video is bandwidth.
5. The sampling rate used for audio CD is 22.05 kHz.
6. Lossless compression is commonly used in streaming video and audio.
7. To seamless display a video game, Persistence of Vision requires at least 5 frames per second.
8. Morphing is a special effect that changes one image into another through a seamless transition.
9. The color model used by a television or a computer monitors is RGB.
10. Component video is an analogue video system comprising three signals that carry picture information in RGB color.

II. 單選題(20%，每題 2 分)

1. The process of generating a pattern of pixels from a model is called
(1) anti-aliasing (2) rasterizing (3) imaging (4) rendering.
2. Which of the following graphics formats is XML-based?
(1) SVG (2) GIF (3) PICT (4) Flash
3. VRML stands for (1) Very Realistic Motion Language (2) Virtual Realistic Motion Language (3) Virtual Reality Modeling Language (4) Virtual Reality Movie Language.
4. Which of the following analogue broadcast standards for color television is used in North America, Japan, and Taiwan? (1) PAL (2) NTSC (3) SECAM (4) iTune.
5. Which of the following Color Models is used for printing?
(1) RGB (2) HSV (3) CMYK (4) YIQ
6. The frame rate of television display is
(1) 15 fps (2) 24 fps (3) 30 fps (4) 36.
7. Which of the following shading algorithms is commonly used in 3D graphics accelerator?
(1) Phong (2) Gouraud (3) radiosity (4) ray-tracing.
8. Which of the following rendering methods is the slowest? (1) z-buffer (2) scan-line (3) ray-tracing (4) painter algorithm
9. In video, which of the following is not a codec?
(1) MPEG (2) NTSC (3) DV (4) Cinepak.

10. Which of the following standard is used for communicating between electronic musical instruments and music software such as sequencers? (1) MPEG (2) MP3 (3) MIDI (4) Flash

III. 寫出英文全名(10%，每題 2 分)

1. XML

full-name: _____

2. SVG

full-name: _____

3. RTSP

full-name: _____

4. XSLT

full-name: _____

5. CSG

full-name: _____

IV. 問答題(5 題，每題 10 分，共 50 分)

1.

(a) Suppose that we have a 60 second video clip that displays at 30 frames a second. The dimension of the video is 640x640 and each pixel is represented in 24bits (true color). What is the file size of the video? (write down your math) (5%)

(b) Write down 5 geometric transformations in 3D modeling (5%)

2.

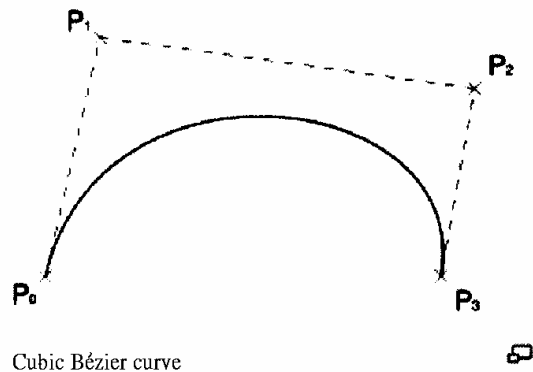
(a) What is the difference between vector graphics and bitmapped images? (5%)

(b) Please compare with SVG and Flash.(5%)

3. For the following cubic Bezier Curve, $P_0=(2,3,0)$, $P_1=(4,7,0)$, $P_2=(12,6,1)$, $P_3=(10,3,1)$, compute
- $B(0)$
 - $B(0.5)$
 - $B(1)$
 - Compute the unit tangent vector at P_0
 - Write down the control vertices of the cubic Bezier Curve.

The Bezier curve is computed with the following formula.

$$B(t) = P_0(1-t)^3 + 3P_1t(1-t)^2 + 3P_2t^2(1-t) + P_3t^3, t \in [0,1].$$



- Write down at least 3 modeling techniques in 3D modeling. (5%)
 - What is UV-mapping? (5%)

- Please explain key-frame animation techniques? (5%)
 - Please explain inverse kinematics techniques in 3D animation and give an example. (5%)