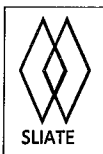# SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION
(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Information Technology
First Year, Second Semester Examination – 2016
IT 2002 /HNDIT1210 - Graphic and Multimedia
Marking Scheme

Instructions for Candidates:	No. of questions : 06
Answer any five questions	No. of pages : Four pages
All questions carry equal marks	Time : Three (03) hours

Q1.

i. Why we use multimedia, writ four (04) reasons (04 marks)
   a. Ease of use
   b. Immersive experience
   c. Interaction and better retention
   d. Better understanding
   e. Cost effectiveness
   f. More fun = Greater efficiency

   (Any four, give marks)

ii. Write peoples' remembering levels with percentages based on Edger Dale
   (04 marks)

   a. 10% of what they read,
   b. 20% of what they hear,
   c. 30% of what they see,
   d. 50% of what they hear and see, → multimedia approach

iii. Based on several multimedia elements we regularly use two modalities. Fill in the blanks in the chart given below regarding modalities (1 to 6) (06 marks)
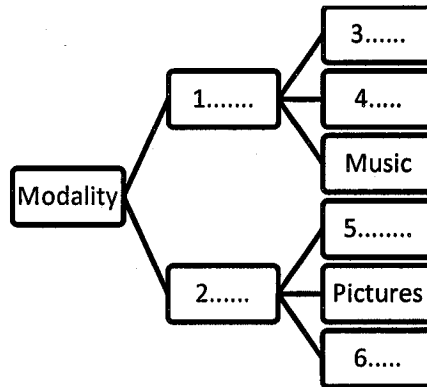
1. Auditory
2. Visual
3. Noises or Speech
4. Speech or noises
5. Word or movies
6. Movies or word

(For 3, 4, 5, & 6, order is not a matter)

iv. Kamal is a HNDIT 2nd year student. He wants to create a video about his course. He is including about his ATI, facilities and course details. After, creating this short film he uploads it in YouTube also.
Write six (06) components, he needs to complete this short film.

(06 marks)

1 **Capture devices** -- Video Camera, Video Recorder, Audio Microphone, Keyboards, mice, graphics tablets, 3D input devices, tactile sensors, VR devices. Digitising/Sampling Hardware
2 **Storage Devices** -- Hard disks, CD-ROMs, Jaz/Zip drives, DVD, *etc*
3 **Communication Networks** -- Ethernet, Token Ring, FDDI, ATM, Intranets, Internets.
4 **Hardware Systems** -- Multimedia Desktop machines, Workstations, MPEG/VIDEO/DSP Hardware
5 **Software System** -- Multimedia Authoring tools, YouTube uploader and other essential software such as Operating System and Browser
6 **Display Devices** -- CD-quality speakers, HDTV, SVGA, Hi-Res monitors, Colour printers *etc*.

(Total Marks 20)

Q2.

i. Graphics is not only to make pretty pictures and funny movies. Write three (03) reasons why we study graphics? (03 marks)
   a. Understanding

b. Expression
c. Communication

ii. Write three (03) examples of computer graphic applications.   (03 marks)
   a. Car model development
   b. Electronic circuit and engineering drawing.
   c. Computer aided design and engineering analysis
   d. Scientific Visualization
   e. Entertainment and Gaming
   f. Military Planning & Rehearsal
   g. Computer-Assisted Surgery Medical Education & Visualization
   h. Business presentation graphics

                                             Any suitable answer

iii. Explain the terminologies "raster images" and "vector images"
                                                                       (04 marks)

Vector image
Draw type image or object oriented image
Represented in geometric form (mathematical instruction) to create straight line,
oval, curve and sphere.
   E.g. instruction:
             Line startcoord = "x.0 y.0"
                  endcoord = "x.20 y.20"
Vector graphics (also called geometric modeling or object-oriented graphics) is
the use of geometrical primitives such as points, lines, curves, and polygons,
which are all based upon mathematical equations to represent images in computer
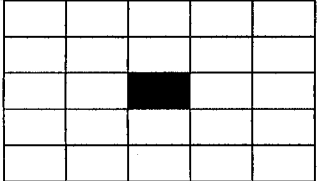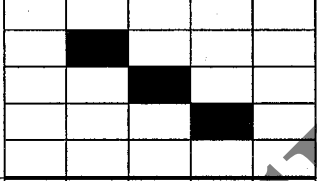graphics.
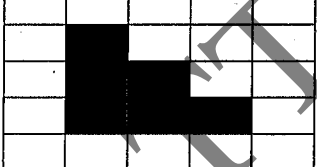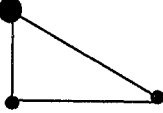
Raster image
   • Representing image in dot form known as pixel or bit
   • Arrange in simple matrix
   • For monochrome monitor, needs a matrix dimension.
   • The depth needed to view color image such as 4, 8, 16, 24 bit
   • A raster graphics image or bitmap, is a data structure representing a
     generally rectangular grid of pixels, or points of color, viewable via a
     monitor, paper, or other display medium.
   • Raster graphics are technically characterized by the width and height of
     the image in pixels and by the number of bits per pixel (a color depth,
     which determines the number of colors it can represent).

iv. Write reasons to convert rater images into vector images   (04 marks)

   (1) Better visual appearance of vector features

(2) Some plotter work only on vector data

(3) Comparison with vector data is best when both data files have identical formats

v. Draw raster and vector data structure for following sample objects   (06 marks)

	Raster	Vector
A point		
A line		
A Triangle (or any polygon)		

(Any polygon give marks)

(Total Marks 20)

Q3.

i. Name "a" to "d" in sound wave shown below   (04 marks)

Duration (Time in Second)
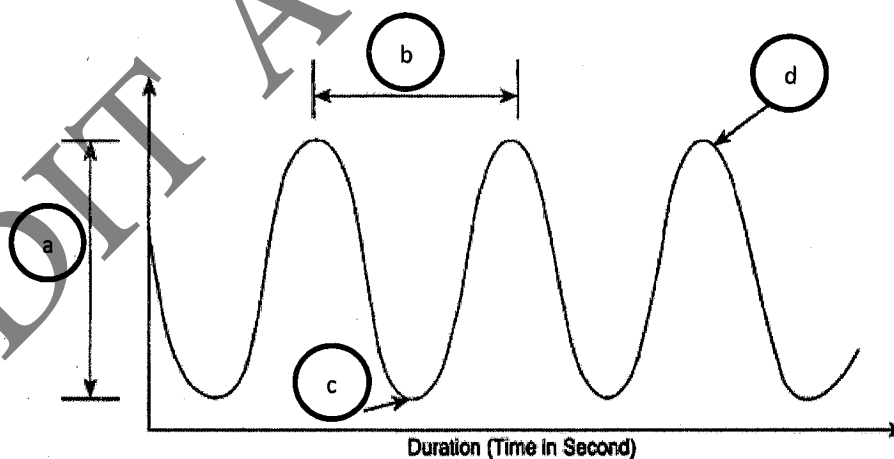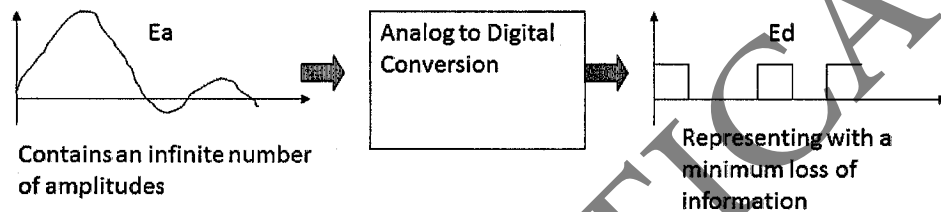
a. Amplitude

b. Period

c. Trough

d. Crest

ii.   Draw and explain the digitization process   (04 marks)

Process of converting analog data into digital data is known as digitization.

iii.   The 3 minute and 20 second stereo song has to be recorded in CD quality
(Sampling frequency = 44100Hz (44.1 KHz) and sampling depth: 16 bit). How
much disk space is utilized by song?
*[Hint: file size (bits) = sampling frequency (Hz) x sampling depth (bits) x length of
sound(s) x channels]*   (04 marks)

File size = 44100*2*200*2 = 35,280,000bytes per second

iv.   What are the main requirements of making MIDI audio?   (04 marks)

Knowledge of music and some talent
Ability to play a musical instrument
Sequencer software (Smart Score)
Sound synthesizer
    Built into PC board
    Add-on for MAC

v.   Silva is creating multimedia project and he is going to include sounds in his
project. He includes both content sounds and ambient sounds in his project.
Briefly explain the above-mentioned sound types.   (04 marks)

Content Sound
Provides information to audiences. (Dialogs in movies or theater)
Ambient sound
Consists of array of background & sound effects

Q4.

i.   What is the difference between "Animation" and "Video"?   (04 marks)

An animation is an animated drawing, cartoon, etc.
A video is a live recorded motion picture.

Although "video" is often used to refer to any kind of audio/visual recording,
An animation is never referred to a live recording.

In animation, we are giving some effects to particular object, but in video, we
can't.

A video is recorded from actual footage where as an animation is made digitally.

ii. Two (02) families of digital video camcorders are "Professional" and "Personal"
     write two characteristics of each family   (04 marks)

Professional
Very expensive
Very expandable
Interchangeable lenses
Large
3 CCD

Consumer
Cheep
1 CCD
Limited expandability

iii. Briefly explain three(03) animation principals   (06 marks)
*   The **"squash and stretch"** principle define the method to give a sense of weight
    and flexibility to drawn objects. The most important aspect of this principle is the
    fact that an object's volume *does not* change when squashed or stretched.
*   **Anticipation** is used to prepare the audience for an action, and to make the action
    appear more realistic. A dancer jumping off the floor has to bend his knees first; a
    golfer making a swing has to swing the ball back first
*   **Straight ahead action and pose to pose** are two different approaches to the
    actual drawing process. "Straight ahead action" means drawing out a scene frame
    by frame from beginning to end. "pose to pose" involves starting with drawing a
    few, key frames, and then filling in the intervals
*   **Follow through** is the termination part of an action. An example is in throwing a
    ball - the hand continues to move after the ball is released. In the movement of a

complex object different parts of the object move at different times and different rates.

- **Overlapping** means to start a second action before the first action has completely finished. This keeps the interest of the viewer, since there is no dead time between actions.
- **Slow in & out** refers to the spacing of the frames in between positions. Rather than having a uniform velocity for an object, it is more appealing, and sometimes more realistic, to have the velocity vary at the extremes. Ex:- a bouncing ball moves faster as it approaches or leaves the ground and slower as it approaches leaves
- **Arcs** Most human and animal actions occur along an arched trajectory, and animation should reproduce these movements for greater realism. This can apply to a limb moving by rotating a joint, or a thrown object moving along a parabolic trajectory.
- Adding **secondary actions** to the main action gives a scene more life, and can help to support the main action. The important thing about secondary actions is that they emphasize, rather than take attention away from the main action A person walking can simultaneously swing his arms or keep them in his pockets,
- **Exaggeration** is a representation of something in an excessive manner. Exaggeration does not mean just distorting the actions , but the animator must carefully choose which properties to exaggerate.
- **Appeal** in a cartoon character corresponds to what would be called charisma in an actor. The important thing is that the viewer feels the character is real and interesting. A scene or character should not be too simple (boring) or too complex.

If any three give marks.

iv.   In general an animation sequence is designed with the main three steps. These are
    a. Story board layout
    b. Specify the key frame
    c. Generation of in between key frames

    Briefly explain above mention three steps   (06 marks)

    a. Story board layout
    ❖ The story board is a linear representation of the situations and events that make up the story(outline of the action)
    ❖ It describes most of the major features as well as the plot and its development
    ❖ It defines motion sequences as a set of basic events that are to take place.
    ❖ Depending on the type of animation to be produced, the storyboard could consist of a set of rough sketches or it could be a list of basic ideas for the motion.

b. Specify the key frame

A key frame is a drawing that defines the starting and ending points of any smooth transition.
A detailed drawing of the scene at a certain time in the animation sequence.
Within each key frame each object is positioned according to the time for that frame
A sequence of key frame defines which movement the spectator will see
Whereas the position of the key frames on the animation defines the timing of the movement.

c. Generation of in between key frames
In-betweening or tweening is the process of generating intermediate frames between two images.
It gives the appearance that the first image evolves smoothly into the second image.
In-betweens are the drawings between the key frames which help to create the illusion of motion.

(Total Marks 20)

Q5.

i. What are the two(02) main types of image file compression   (02 marks)
Lossless
Lossy

ii. Expand the following abbreviations   (04 marks)
a. TIFF - Tag Interchange File Format
b. GIF - Graphics Interchange Format
c. PICT - Picture File Format
d. JPEG - Joint Photographic Experts Group

iii. Briefly Explain about color space compression   (04 marks)
a. Uses human eye characteristics
   i. Less sensitive to color than lightness
   ii. Less sensitive to **Red than Green**
b. YUV colour space
   i. Originally developed for colour TV signal
   ii. Convert colour to Luminance(Y) and Chrominance (U,V) values

iv. Encode the following image using run length method using "0" for white and "1" for black   (10 marks)

	1	2	3	4	5	6	7	8	9	10	11	12	13

Row 1: "0" , 13

Row 2: "0" , 3, 6, 4

Row 3: "0" , 1, 2, 6, 2, 3

Row 4: "0" , 9, 2, 2

Row 5: "0" , 10, 1, 2

Row 6: "0" , 3, 6, 1, 1, 2

Row 7: "0" , 2, 9, 2

Row 8: "0" , 1, 2, 7, 1, 2

Row 9: "0" , 1, 1, 8, 1, 2

Row 10: "0" , 1, 1, 7, 2, 2

Row 11: "0" , 1, 1, 7, 2, 2

Row 12: "0" , 1, 2, 4, 2, 1, 1, 2

Row 13: "0" , 2, 6, 2, 2, 1

Row 14: "0" , 3, 4, 6

(Total Marks 20)

Q6.

i. Write three (03) things we should ensure when delivering a multimedia project

(03 marks)

– Bug free
– Accurate
– Operationally and visually on target
– The client requirements have been met.

ii. Write three (03) advantages of using a file archives   (03 marks)

• Take less time to transmit by modem than do uncompressed files.
• East to uploading and downloading online files.

- Self-extracting archives are useful for delivering projects on disks in compressed form.
- Some compression applications allow you to compress, split and store large files on several floppy disks or Zip disks; the segments of these files are then automatically rejoined during installation.
- Provide an encryption or security feature, so that people who have access to disks containing private archive files cannot read them without authorization. This helps hide classified data.

iii.   What is the main difference between 'key frame' and 'frames' in Flash?

(04 Marks)

A *keyframe* is a frame where a new symbol instance appears in the Timeline. A keyframe can also be a frame that includes ActionScript® code to control some aspect of your document. You can add a *blank keyframe* to the Timeline as a placeholder for symbols you plan to add later or to explicitly leave the frame blank.

iv.   Flash can create two types of tweened animation: "motion tweens" and "shape tweens". Briefly explain the term 'Tweening'?   (04 Marks)
In betweening or **tweening** is the process of generating intermediate frames between two images to give the appearance that the first image evolves smoothly into the second image. In betweens are the drawings between the key frames that help to create the illusion of motion.

v.   The below picture contains a set of Photoshop tools. State the name and functions of three of them.   (06 Marks)

(Total marks 20)

Rectangular Marquee Tool (M)

Use this tool to make selections on your image, in a rectangular shape. This changes the area of your image that is affected by other tools or actions to be within the defined shape. Holding the [Shift] key while dragging your selection, restricts the shape to a perfect square. Holding the [Alt] key while dragging sets the center of the rectangle to where your cursor started.

Move Tool (V)

Use this tool to, well, move things. Usually you use it to move a Layer around after it has been placed. Hold the [Shift] key to limit the movements to vertical/horizontal.

Polygon Lasso Tool (L)

Ok, this should be the Lasso Tool, but I use the Polygon Lasso a lot more often. Use this to draw selections in whatever shape you would like. To close the selection, either click on the beginning point (you'll see the cursor change when you're on it), or just double-click. When holding the [Ctrl] key, you'll see the cursor change, and the next time you click, it will close your selection.

Magic Wand Tool (W)

Use this to select a color range. It will select the block of color, or transparency, based on wherever you click. In the Options Bar at the top, you can change the Tolerance to make your selections more/less precise.

Crop Tool (C)

The Crop Tool works similarly to the Rectangular Marquee tool (see above if you have no short-term memory). The difference is when you press the [Enter/Return] key, it crops your image to the size of the box. Any information that was on the outside of the box is now gone. Not permanently, you can still undo.

Slice Tool (K)

This is used mostly for building websites, or splitting up one image into smaller ones when saving out. It's kind of an advanced tool, and since you're in here for the basics, we'll kind of skip over it. Kinda makes you mad I made you read all that for nothing, huh?

Healing Brush Tool (J)

This is a really useful tool. Mildly advanced. You can use this tool to repair scratches and specs and stuff like that on images. It works like the Brush tool (see below). You choose your cursor size, then holding the [Alt] key, you select a nice/clean area of your image. Let go of the [Alt] key and paint over the bad area. It basically copies the info from the first area to the second, in the form of the Brush tool. Only, at the end, it averages the information, so it blends.

Brush Tool (B)

This is one of the first tools ever. It's what Photoshop is based off of. Well, not really, but it's pretty basic. It paints one your image, in whatever color you have selected, and whatever size you have selected. There's a lot of options for it, but this is basic, so you don't get to learn them. Ha.

Clone Stamp Tool (S)

This is very similar to the Healing Brush Tool (see above). You use it the exact same way, except this tool doesn't blend at the end. It's a direct copy of the information from the first selected area to the second. When you learn to use both of these tools together in perfect harmony, you will be a Photoshop MASTA! Not really, it's just less irritating.

History Brush Tool (H)

This tool works just like the Brush Tool (see above) except the information that it paints with is from the original state of your image. If you go Window>History, you can see the History Palette. The History Brush tool paints with the information from whatever History state is selected.

Eraser Tool (E)

This is the anti-Brush tool. It works like an eraser (duh) and erases whatever information wherever you click and drag it. If you're on a Layer, it will erase the information transparent. If you are on the background layer, it erases with whatever secondary color you have selected.

Gradient Tool (G)

You can use this to make a gradiation of colors. Gradiation doesn't appear to be a word, but it makes sense anyway. It creates a blending of your foreground color and background color when you click and drag it. Like a gradient.
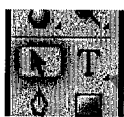
Blur Tool (R)

The Blur tool is cool. It makes things blurry. Click and drag to make things blurry. The more you click and drag, the blurrier things get.

Dodge Tool (O)

This tool isn't as crappy as the car brand. It's actually used to lighten whatever area you use it on. As long as it is not absolute black. Absolute black won't lighten.

Path Selection Tool (A)

You use this tool when working with paths. Since this is all about the basics, I won't go into details. It's related to the Pen Tool (see below) though.

Horizontal Type Tool (T)

It makes type. Or text. Or whatever you want to call it. You can click a single point, and start typing right away. Or

you can click and drag to make a bounding box of where your text/type goes. There's a lot of options for the Type Tool. Just play around, it's fairly straight-forward.

Pen Tool (P)

I mentioned this tool above. It's for creating paths, in which you would use the Path Selection Tool to select the path. Paths can be used in a few different ways, mostly to create clipping paths, or to create selections. You use the tool by clicking to add a point. If you click and drag, it will change the shape of your path, allowing you to bend and shape the path for accurate selections and such.

Rectangle Tool (U)

By default it draws a Shape Layer in the form of a rectangle. It fills the rectangle with whatever foreground color you have selected. It's pretty complicated, don't hurt yourself with this one.

Notes Tool (N)

Like post-it notes, but digital. You can use this tool to add small little note boxes to your image. These are useful if you're very forgetful or if you're sharing your Photoshop file with someone else. I'm pretty sure it only works with .PSD files.

Eyedropper Tool (I)

This tool works by changing your foreground color to whatever color you click on. Holding the [Alt] key will change your background color.

Hand Tool (T)

You can really make short work of your job with the Hand Tool. It's for moving your entire image within a window. So if you're zoomed in and your image area is larger than the window, you can use the Hand Tool to navigate around your image. Just click and drag. You can get to this tool at any time when using any other tool by pressing and holding the [Spacebar].

Zoom Tool (Z)

Pretty obvious what this tool does. It allows you to zoom into your image. Don't be dumb, it doesn't actually change the size of your image. Hold the [Alt] key to zoom out. Holding the [Shift] key will zoom all of the windows you have open at the same time. Double-click on the Zoom Tool in the palette to go back to 100% view.
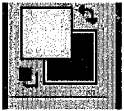
Color Boxes

These are your color boxes. Foreground (in the front) and Background (in the back). Click on either one to bring up the color select dialog box.

If any three, give marks.