UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2019 – 3rd Year Examination – Semester 5

IT5405: Fundamentals of Multimedia

Structured Question Paper

07th July, 2019

(TWO HOURS)

To be completed by the candidate

BIT Examination Index No: .....

Important Instructions:

- The duration of the paper is **2 (two) hours**.
- The medium of instruction and questions is English.
- This paper has **4 questions** and **15 pages**.
- **Answer all questions.** All questions **do not** carry **equal** marks.
- **Write your answers** in English using the space provided **in this question paper**.
- Do not tear off any part of this answer book.
- Under no circumstances may this book, used or unused, be removed from the Examination Hall by a candidate.
- Note that questions appear on both sides of the paper.
  If a page is not printed, please inform the supervisor immediately.
- Calculators are **not** allowed.
-

Questions Answered

Indicate by a cross (×), (e.g. [X]) the numbers of the questions answered.

	Question numbers				
To be completed by the candidate by marking a cross (×).	1	2	3	4	
To be completed by the examiners:					

Index No …….

1) (a) "Applications of multimedia is used in many fields", Explain briefly

(08 marks)

ANSWER IN THIS BOX

Business application including presentation, database, catalogues,

Training (flight safety demo),

Marketing,

Advertising,

Product demo,

Voice mail and video conferencing.

Instant messaging and networked communications.

Game Industry

Teaching (animation and simulations)

Medicine (Scanners, MRI, CT Scan)

cartoon

Photography

Films industry

Briefly explain important points (Ref-1 Page 4-5)

(b) State briefly the role of the Interface Designer.

(05 marks)

ANSWER IN THIS BOX

- Creates in its a simplest form
- Interface provides control to the people who use it
- Provide Access to "Media" of multimedia (text, Graphics, animations, audio, video)
- The elegant simplicity of a multimedia title screen, the ease with which the user can move about within a project, effective use of windows, background icons and control panels.

(Student should be able to write relevant points)

(c) Explain what is meant by Kinematics, Inverse kinematics, Morphing and Tweening.

(08 marks)

ANSWER IN THIS BOX

• Kinematics –study of movement and motion of structures with joints

• Inverse kinematics – defining the limits and relationships of objects

• Morphing – transformation of one image to another

• Tweening –the action of calculating the number of frames and paths of action between 2 keyframesand filling them

(d) Compare the broadcast video standards of "PAL" and "NTSC."

(04 marks)

ANSWER IN THIS BOX

Broadcast Video Standards •PAL –Phase Alternate Line •NTSC –National Television Standards Committee

NTSC is the standard broadcast format in the United States, while PAL is the standard broadcast format in Europe, Australia, and parts of Asia

PAL televisions produce 25 frames per second that causes motion to be displayed faster.

NTSC refreshes the screen 30 times a second, while PAL systems do so 25 times a second

(additional information)

	NTSC	PAL
	urrent rating is 3.57/54	urrent rating is 4.07/54
	(541 ratings)	(736 ratings)
Abbreviation	National Television System Committee	Phase Alternation by Line
Video Bandwidth	4.2 MHz	5.0 MHz
Sound Carrier	4.5 MHz	5.5 MHz
Bandwidth	6 MHz	7 to 8 MHz
Vertical Frequency	60 Hz	50 Hz
Horizontal Frequency	15.734 kHz	15.625 kHz
Color Subcarrier Frequency	3.579545 MHz	4.433618 MHz
Lines/Field	525/60	625/50

Note available on: (Creating Video Animation 1.pdf- (Slide 3)

2) a) What is the functionality of the Charge Coupled Device (CCD) in the video camera?

(05 marks)

ANSWER IN THIS BOX

CCD (Charge Coupled Device) – converts light to electric signals. 3 CCDs (for Red, Green & Blue) are needed for high quality broadcast. In Digital Cameras images focused on a chip called CCD. The face of a CCD is studded with transistors

• They create current in proportion to the intensity of light striking them.

• These transistors make up the pixels of the image.

• CCD does not output digital signals (Electrical charges that built up in CCD are not digital)

(b) Write down the Factors of Motion Picturing when you capture a moving object.

(05 marks)

ANSWER IN THIS BOX

–The shutter speed

–The speed of the moving subject

–The subject distance: Closer the subject distance, more blurring the moving subject.

–Focal length: Longer the focal length, the more blurring the moving subject.

Photography Basic Image (slide 27)

(c) What is Depth of Field?

(06 marks)

ANSWER IN THIS BOX

An image on the true focusing point is absolutely sharp.

• Things that are nearer or further away may still look reasonably sharp.

• Such sharpness zone is called Depth of field. It is the zone of acceptably sharp focus extending both in front of and behind the true focusing point.

• The Depth of field can vary from a few centimetres to infinity What affects the Depth of Field?

Whenever you alter… –The lens aperture –The focal length –The focused distance The Depth of Field gets deeper or shallower

(d) Explain briefly three types of "texture nodes".

(09 marks)

ANSWER IN THIS BOX

Texture Nodes

•3 types

•ImageTexture :-can map external JPEG or PNG image onto the shape. It's the most common.

•MovieTexture:–can map an MPEG movie onto object (can also specify start/stop times).

•PixelTexture:–creating an image to use with ImageTexture

Virtual_Realiti_VRM L (slide 8)

3)

(a) Compare Bitmap and Vector images.

(08 marks)

ANSWER IN THIS BOX

Bitmaps	Vector
Bitmap graphics are comprised of dots, called pixels, arranged in a grid. Your computer screen is a large grid of pixels.	• Vector graphics describe images using lines and curves, called vectors, that include color and position information.
In a bitmap version of the leaf, the image would be determined by the location and color value of each pixel in the grid.	• For example, the image of a leaf may be described by a series of points, the result of which is the leaf's outline.
Each dot is assigned a color. When viewed at the correct resolution, the dots fit together like tiles in a mosaic to form the image.	The leaf color is determined by the color of the outline, or stroke, and the color of the area enclosed by the outline, or the fill. Line – Many Algorithms – Clipping
Pixel based –Group of colored dots	• Curve – Parametric Curve • Draw curve as a function of independent parameter
Best for real-world image Photography, Painted picture	• BSplinecurve • Béziercurve
Large data size –Needs compression for transfer	
Resolution Dependent	
Not suitable for resizing/zooming	
Multimedia productions usually include numerous image and sound files	
Storage space required can be quite extensive.	
Slow storage devices, narrow bandwidth of networks affect bit map images. Difficult to present the multimedia in real time.	
• Loss-lessCompression – Every pixel in the image is preserved during compression. – Can reproduce original image without loss – Not high compression ratio (~2.0) – Algorithms: RLE, LZW, etc.	

More Details

Unlike bitmaps, vector images are not based on pixel patterns, but instead use mathematical formulas to draw lines and curves that can be combined to create an image from geometric objects such as circles and polygons. Vector images are edited by manipulating the lines and curves that make up the image using a program such as Adobe Illustrator.

Vector images have some important advantages over bitmap images. Vector images tend to be smaller than bitmap images. That's because a bitmap image has to store color information for each individual pixel that forms the image. A vector image just has to store the mathematical formulas that make up the image, which take up less space.

Vector images are also more scalable than bitmap images. When a bitmap image is scaled up you begin to see the individual pixels that make up the image. This is most noticeable in the edges of the image. There are ways of making these jagged edges less noticeable but this often results in making the image blurry as well. When a vector image is scaled up, the image is redrawn using the mathematical formula, so the resulting image is just as smooth as the original.

The three most popular image formats used on the Web (PNG, JPEG, and GIF) are bitmap formats. The Scalable Vector Graphics (SVG) format comes in a distant fourth due to a legacy of poor support for vector graphics in early browsers. Today however, all major browsers support the SVG (Scalable Vector Graphics) format.

Bitmap formats are best for images that need to have a wide range of color gradations, such as most photographs. Vector formats, on the other hand, are better for images that consist of a few areas of solid color. Examples of images that are well suited for the vector format include logos and type.

(b) What is "Lempel Ziv-Welch" Compression algorithm. Explain briefly.

(05 marks)

ANSWER IN THIS BOX

Lempel-Ziv-Welch (LZW)

• Dictionary based coding algorithm

• Another Loss-Less compression algorithm.

• It was not designed specifically for graphics

• Data Dictionary is used to represent linear sequences of data in a uncompressed input stream. Then uses an algorithm similar to RLE.

• It does not work well with black and white or true colourimages.

• Uses with GIF

(Graphics Image Compression and File Formats (Slide- 13)

(c) Explain the usefulness of "GIF" image type.

(04 marks)

ANSWER IN THIS BOX
• Many useful features • Transparency (1 bit only)
• Interlace (for fast perception over net) -GIF display in a series of four passes, 12.5%,25%, 50%,100% (not from top to bottom)
• Animation (Cell Animation)
• Suitable for small pictures / icons
• Flexible choice of bit-per-pixel (1~8)
• Indexed color only (no full color support) max of 256 colours (8 bits)
• Uses LZW compression (loss less) When to use GIFs – Well Suited for any image with areas of flat coloursuch as logos, line art, icons, cartoonlike illustrations. – If you want a portion of the image to be transparent. – Good option for adding simple animation to your page. – Not good for Photographic images. true colour information is lost (8-bit limit), JPEG better
Note: Graphics Image Compression and File Formats (Slide- 20,21)

(d) State whether the following statements (from i to iii) are correct or incorrect by circling your answer.

(06 marks)

i. A layer's opacity determines to what degree it reveals the layer beneath it. A layer with 1% opacity appears nearly transparent, while one with 100% opacity appears completely opaque.

☐ Correct ☐ Incorrect

ii. You can create alpha channels to store selections as grayscale images. You use alpha channels to create and store masks, which let you manipulate, isolate, and protect specific parts of an image.

☐ Correct ☐ Incorrect

iii. Optimization is the process of fine-tuning the display quality and file size of an image for use on the Web or other online media. Adobe Photoshop and Adobe ImageReady give an effective range of controls for compressing the file size of an image while optimizing its online display quality.

☐ Correct ☐ Incorrect

(e) Write down all the animation file extensions from the list given below in the answer box.

.max	.avi	.mov
.mpeg	.gif	.swf
.fla	.amf.	.vls

(02 marks)

ANSWER IN THIS BOX

max, .avi, .mov, .mpeg, .gif, .swf

4)

(a) It is possible to add actions to buttons in the movie or to use keyframes. Considering two movie clips (“A.swf” and “B.swf”), state the scripts required for the given buttons to load the movie file “B.swf” into “A.swf” using Flash MX.

(05 marks)

ANSWER IN THIS BOX

```
on (release) {
loadMovie("EndPage.swf",_root);
}
```

(b) Assume that the user wants to remove a section from 00:00:12:3 to 00:00:15:5 from the video clip B. What is the tool or the method to remove the above unnecessary section from the original clip using Adobe Premier software?

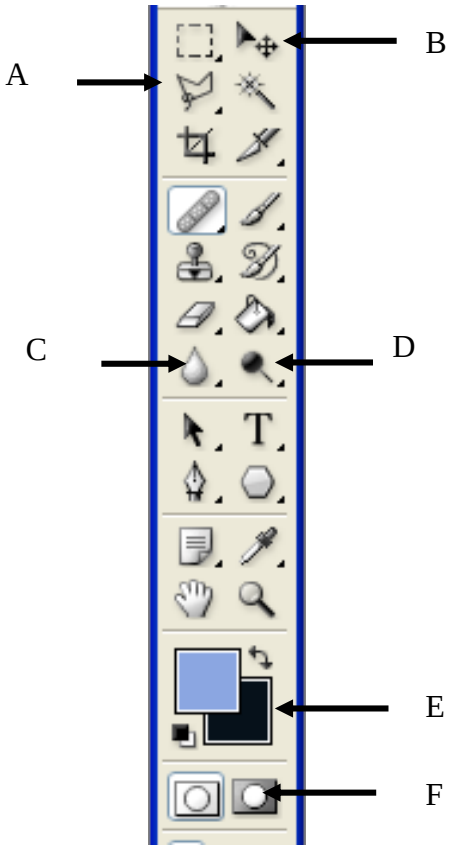
(03 marks)

ANSWER IN THIS BOX

Razor Tool

(c) Identify and label the tools from A to F in photoshop shown in the diagram below.

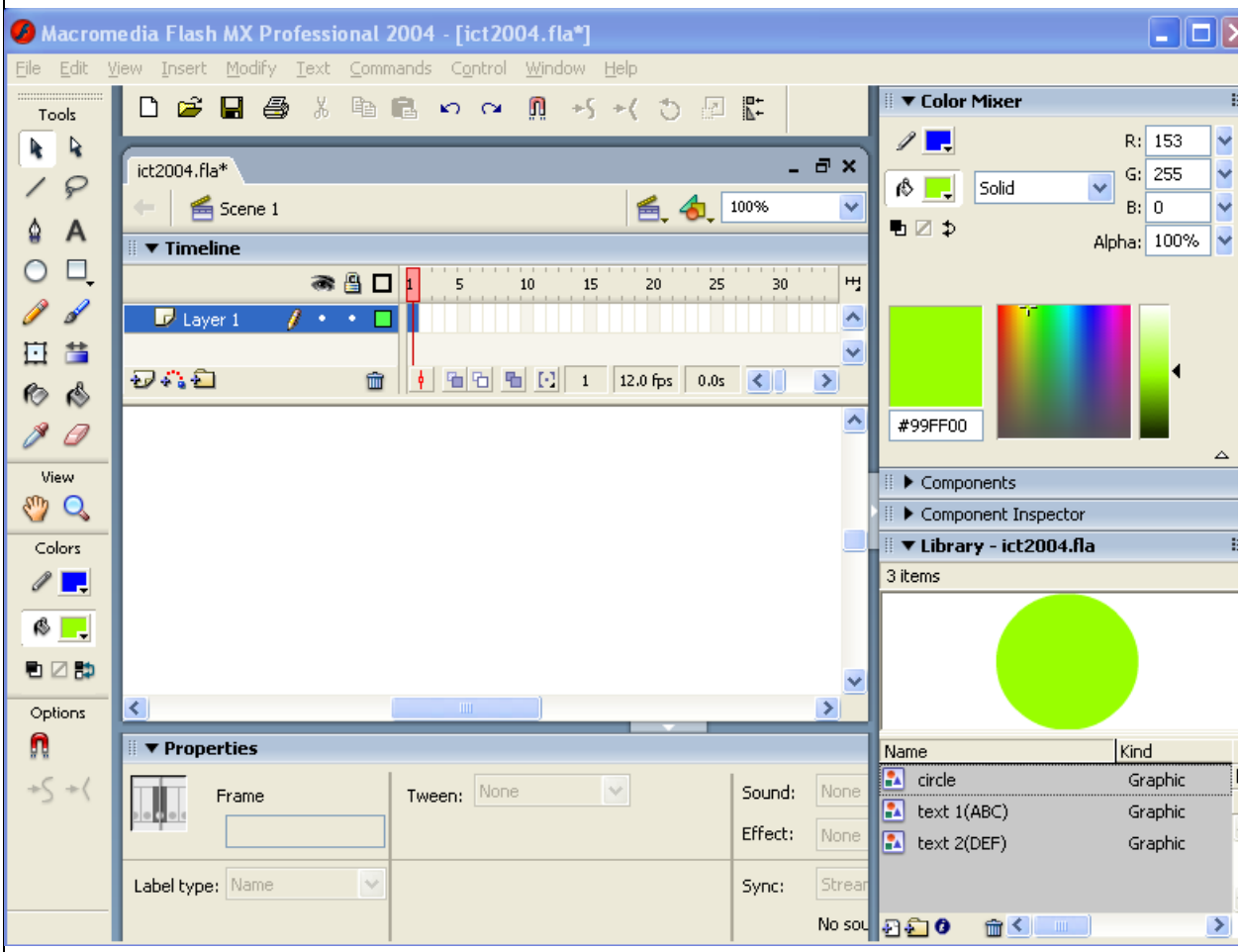
(06 marks)



ANSWER IN THIS BOX
A-Polygonal Lasso Tool
B-Move Tool
C-Blur
D-Dodge
E-Set Background Color
F-Edit in quick Mask mode

(d) Regarding the "Library –ict2004.fla" below, write down the steps or procedure needed to move the "circle" symbol from left to right using frame 1 to frame 30.

(05 marks)



ANSWER IN THIS BOX

Drag Circle into frame 1 then Select 30th frame >>right click>> insert Keyframe>>> keep cursor middle of the frames >>>right click>> create motion tween

(e) Using the same library write down the steps or procedure to change the content of the text which is in the "text 1(ABC)" file into the content of the text in "text 2 (DEF)" file.

(06 marks)

ANSWER IN THIS BOX

Drag ABC in to frame one >> select text object >>right click>> Break a part it twice. Again insert a blank key frame drag and drop DEF >> select it >>right click >> select break a part twice.

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