UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2021 – 3rd Year Examination – Semester 5

IT5405: Fundamentals of Multimedia

Structured Question Paper

(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 **12 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.
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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) How can multimedia be used to promote online education during this pandemic period? Explain briefly using **five (05)** examples.

(10 marks)

ANSWER IN THIS BOX

1. Conduct live video class
2. Upload pre-recorded video files
3. Create games to support learning activities or explain theories
4. Use animation and cartoons to explain complex theories
5. Use text chat facilities and voice chat facilities to communicate with each other
6. Can be used live writing board to explain content (e.g., Wacom)
7. Use images and 2D illustration to explain theories clearly
8. Use 3D content
9. Augment reality can be used to illustrate some concepts
10. Cyberspace comprises many thousands of geometric objects plotted in 3-dimensional space.

(Multimedia is a form of communication that combines different content forms such as text, audio, images, animations, or video into a single interactive presentation, in contrast to traditional mass media, which featured little to no interaction from users, such as printed material or audio recordings)

(any other correct answer)

(b) Briefly explain why Graphical User Interface (GUI) testing is important when automating software.

(09 marks)

ANSWER IN THIS BOX

GUI Testing is a software testing type that checks the Software's Graphical User Interface. Graphical User Interface (GUI) Testing aims to ensure the functionalities of software applications work as per specifications by checking screens and controls like menus, buttons, icons, etc.

GUI is what the user sees.

If the user resizes the screen, neither images nor content should shrink, crop, or overlap.

How easy it is for him to understand the UI. If a user is not comfortable with the Interface or find the Application complex to understand, he would never be going to use that Application Again

Check all the GUI elements for size, position, width, length, and acceptance of characters or numbers. For instance, you must provide inputs to the input fields.
Check you can execute the intended functionality of the application using the GUI
Check Error Messages are displayed correctly
Check for Clear demarcation of different sections on the screen
Check Font used in an application is readable
Check the alignment of the text is proper
Check the Color of the font, and warning messages is aesthetically pleasing
Check that the images have good clarity
Check that the images are properly aligned
Check the positioning of GUI elements for different screen resolutions.

Loading speed due to heavy images and other multimedia-based content

(c) Briefly explain Dynamic range and Gamma correction in Photoshop.

(06 marks)

ANSWER IN THIS BOX

Gamma correction:

Gamma correction enables you to adjust how an image is displayed on your monitor. The wrong gamma settings can make your image too dark or faded, for example. It's different from brightness settings because it adjusts both light and dark tones.

Incorrect gamma settings can make images look too dark or washed out. This does not mean that the gamma setting is the same as the brightness setting, though, as it only adjusts the dark tones. In Photoshop, you can either adjust the gamma of an image directly or via an adjustment laye

Dynamic range:

Dynamic range describes the ratio between the brightest and darkest parts of an image, from pure black to brightest white. The best digital cameras capture only half as much range as the human eye.

(any other correct answer)

2) a) "A multimedia production team may require discrete roles." Briefly explain how IT can be used to perform the following roles.

I. Sound Producer/ Audio specialists
II. Video Specialist
III. Interface Designer

(09 marks)

ANSWER IN THIS BOX

Sound Producer/ Audio specialists: - Audio specialists are those who make a multimedia program come alive, designing and producing music, voice-over narrations, and sound effects using available software and hardware, e.g., Digital Sound mixture, Audio capturing devices, adobe, etc. They are responsible for locating and selecting suitable music and talent, scheduling recording sessions, and digitizing and editing recorded material into computer files.

Video Specialist: -• Video specialists must understand the potentials and limitations of the medium, how they affect the video production itself, and how to get the most out of it.
• They are responsible for shooting and editing quality videos.
• They are fully responsible for preparing the complete video files for the most efficient delivery on CD, DVD, or the web. (any other correct answer)

• They have to deal with the entire team of videographers, sound technicians, lighting designers, set designers, script supervisors, etc.

Interface Designer • Interface designer's work is transparent.
• The role of an interface designer is to create a software device that organizes the multimedia content that lets the user access or modify the content and presents the content on the screen.
• Interface designer has to design a simple multimedia screen with user-friendliness by effectively using windows, backgrounds, icons, and control panels.

(b) Briefly explain the characteristics of the following.
I. Hue II. Saturation III. Lightness and Brightness

(06 marks)

ANSWER IN THIS BOX

Hue or Color is specified as an angle from 0 to 360 degrees on a color wheel and saturation, brightness, and lightness as percentages.
In color theory, hue is one of the main properties of a color, defined technically in the CIECAM02 model as "the degree to which a stimulus can be described as similar to or different from stimuli that are described as red, orange, yellow, green, blue, violet," which certain theories of color vision call unique hues.
hue is a pure pigment
• Saturation is the intensity of a color. At 0% saturation, the color is white, black, or gray. At 100% saturation, the color is pure.
• Lightness or brightness is the % of black or white mixed with color. 100% -white, 0%-black, 50% pure color.

(C) Briefly explain the American Standard Code for Information Interexchange (ASCII).

(06 marks)

ANSWER IN THIS BOX

American Standard Code for Information Interexchange, ASCII, assigns letters, numbers, and other characters in the 256 slots available in the 8-bit code. The ASCII decimal (Dec) number is created from binary, which is the language of all computers. As shown in the table below, the lowercase "h" character (Char) has a decimal value of 104, which is "01101000" in binary.

ASCII was first developed and published in 1963 by the X3 committee, the ASA (American Standards Association). The ASCII standard was first published as ASA X3.4-1963, with ten revisions being published between 1967 and 1986.

The ASCII table is divided into three different sections.

Non-printable, system codes between 0 and 31.
Lower ASCII, between 32 and 127. This table originates from the older American systems, which worked on 7-bit character tables.
Higher ASCII, between 128 and 255. This portion is programmable; characters are based on the language of your operating system or program you are using. Foreign letters are also placed in this section.

eg

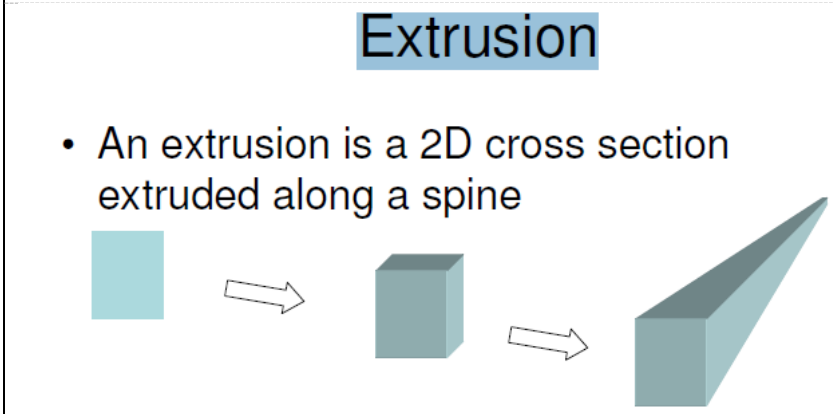
Char	Dec	Binary	Char	Dec	Binary	Char	Dec	Binary
!	033	00100001	A	065	01000001	a	097	01100001
"	034	00100010	B	066	01000010	b	098	01100010
#	035	00100011	C	067	01000011	c	099	01100011

(any other correct answer)

(d) Briefly explain what an Extrusion is using a suitable example and illustration.

(04 marks)

ANSWER IN THIS BOX



3) (a) Briefly explain what Unicode Characters are.

(06 marks)

ANSWER IN THIS BOX

The Unicode Standard provides a unique number for every character, regardless of platform, device, application, or language. It has been adopted by all modern software providers and now allows data to be transported through many different platforms, devices, and applications without corruption. Support of Unicode forms the foundation for representing languages and symbols in all major operating systems, search engines, browsers, laptops, and smartphones—plus the Internet and World Wide Web (URLs, HTML, XML, CSS, JSON, etc.). Supporting Unicode is the best way to implement ISO/IEC 10646.

(b) Describe **five (05)** issues related to Multimedia in networks.

(10 marks)

ANSWER IN THIS BOX

- Cable Problem
- Connectivity Problems
- Excessive Network Collisions
- Software Problems
- Duplicate IP Address
- Over Buffering
- Slow Server Issues
- Video and Audio Latency
- Frame Drop
- Freezing Issues

(any other correct answer)

(c) Briefly explain Adaptive Differential Pulse Code Modulation ADPCM in speech coding.

(04 marks)

ANSWER IN THIS BOX

Adaptive differential pulse code modulation (ADPCM) is a very efficient digital coding of waveforms. In telecommunication, the main field application is speech compression because it makes it possible to reduce the bit flow while maintaining an acceptable quality.

(any other correct answer)

(d) Briefly explain Anti-aliasing using a suitable illustration.

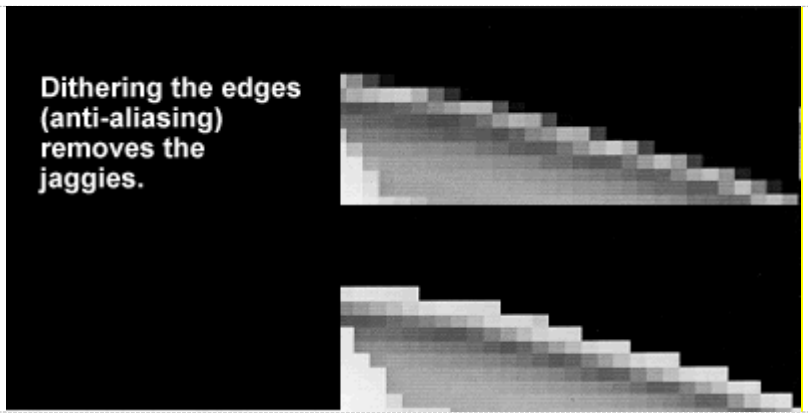
(05 marks)

ANSWER IN THIS BOX

Antialiasing is a technique used in digital imaging to reduce visual defects when high-resolution images are presented in a lower resolution. Aliasing manifests itself as jagged or stair-stepped lines (otherwise known as jaggies) on edges and objects that should otherwise be smooth.

Antialiasing makes these curved or slanting lines smooth again by adding a slight discoloration to the edges of the line or object, causing the jagged edges to blur and melt together. If the image is zoomed out a bit, the human eye can no longer notice the slight discoloration that antialiasing creates.

This technique is called "dithering" but is usually known as anti-aliasing when applied to diagonal and curved lines. It is smoothing the jagged appearance of diagonal lines in a bitmapped image. The pixels surrounding the edges of the line are changed to varying shades of gray or color to blend the sharp edge into the background.



4) (a) Briefly explain three (03) different types of color palettes.

(09 marks)

ANSWER IN THIS BOX

Monochromatic
A popular choice with designers, monochromatic color schemes are formed using various tones and shades of one single color.

Analogous
An analogous color scheme is formed of three colors located next to each other on the color wheel. Similar color palettes are commonly used when no contrast is needed—for example, on the background of web pages or banners.

Complementary
Complementary color palettes are comprised of colors placed in front of each other on the color wheel. For example, a red button on a blue background will stand out on any interface. While the name may suggest otherwise, complementary color palettes are actually the opposite of analogous and monochromatic color palettes, as they aim to produce contrast.

Split-complementary
The split-complementary color palette differs from the complementary color palette only because it employs a higher number of colors. For example, if you choose the color blue, you'll then need to take the two colors that are adjacent to its opposite color, which in this case would be yellow and red.

Triadic
The triadic color scheme is based on three separate colors that are equidistant on the color wheel. Most designers employ the triadic color scheme by choosing one dominant color, and using the other two colors as accents. (any other correct answer)

(b) Briefly explain the following

I Aperture size II. Shutter speed III. F-stop

(06 marks)

ANSWER IN THIS BOX

Aperture size:

Aperture is **defined by the size of the opening through which light can enter the camera**. Aperture sizes range from the widest (f/1.4) to the smallest (f/32). Between them are additional "stops" of f/2, f/2.8, f/4, f/5.6, f/8, f/11, f/16, and f/22.

Shutter speed:

Shutter speed is exactly what it sounds like: It's the speed at which the camera's shutter closes. A fast shutter speed creates a shorter exposure — the amount of light the camera takes in — and a slow shutter speed gives the photographer a longer exposure.

F-stop:

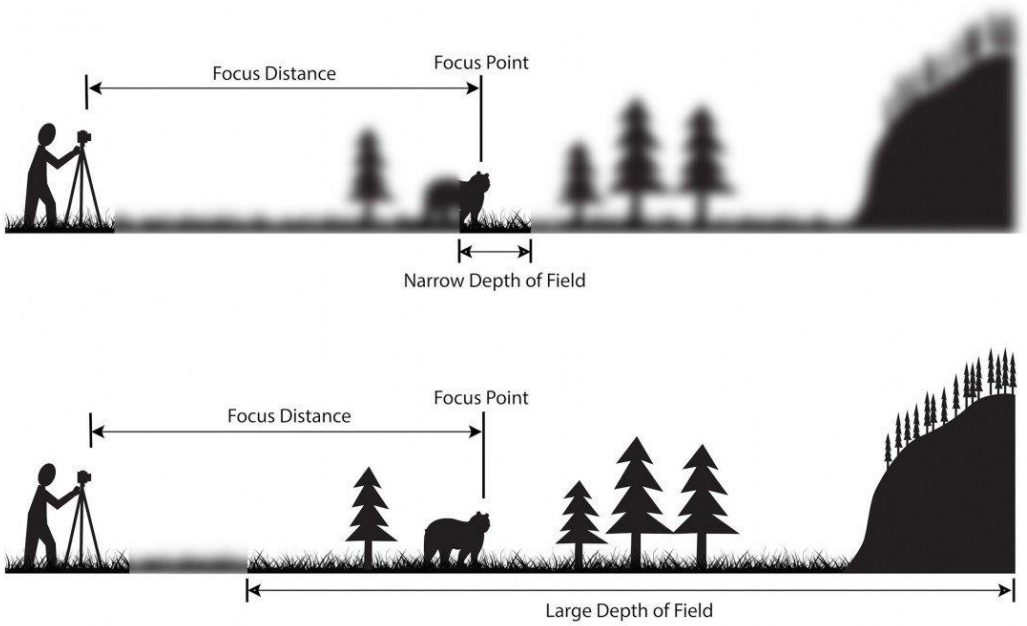
F-stop is the term used to denote aperture measurements on your camera. The aperture controls the amount of light entering the camera lens, measured in f-stops. Along with shutter speed and ISO (sensitivity to light), the aperture is the third fundamental component that makes up the exposure triangle in photography.

(d) Briefly discuss what is meant by the Depth of field.

(06 marks)

ANSWER IN THIS BOX

Depth of field is essentially the distance between the nearest in-focus area and the furthest in-focus area in your shot. When that distance is short/narrow/small, it is known as "shallow depth of field," and your foreground (everything in front of your main subject) and background (everything behind your main subject) appears out of focus, while your main subject appears in focus. When that distance is long/wide/large, it is known as "deep depth of field," and your foreground, mid, and background appear in focus.



(any other correct answer)

(e) What is the rule of thirds in photography?

(04 marks)

ANSWER IN THIS BOX

The rule of thirds is a composition guideline that places your subject in the left or right third of an image, leaving the other two-thirds more open. While there are other forms of composition, the rule of thirds generally leads to compelling and well-composed shots.

(any other correct answer)

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