



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELLOR OF SCIENCE DEGREE IN FORENSIC SCIENCE

SBC 346: FORENSIC DIGITAL IMAGING

DATE: Wednesday 28th March, 2012

TIME: 2.00 p.m. – 4.00 p.m.

INSTRUCTIONS

Section A: Answer ALL Questions; Choose the Best Answer(1 mark each)

1. The following statements are true. Which one is not?
 - a) Both digital and analogue photography employ lenses to focus light rays into a sharp image.
 - b) The size of the image is controlled by the Focal length of the lense.
 - c) Lenses with long focal length produce larger images.
 - d) Focal lengths are generally given in centimeters
2. The following statements are false. Which one is true?
 - a) Three sensor types are commonly used in digital imaging.
 - b) One of the sensor types used in digital imaging is MRI.
 - c) Two primary measures are used to characterize digital images.
 - d) All the above is true.
3. True or false,
 - a) The resolution of a digital camera is often limited by the image sensor.
 - b) Depending on the physical structure of the sensor a colour filter array may be used.
 - c) Image resolution is specified in pixels per inch(ppi).
 - d) As of 2012, the highest resolution on the market for consumer digital camera is 80.1 megapixels.
4. Concerning image processing,
 - a) Once a radiograph has been processed, the image is not permanent and can be further adjusted.
 - b) Digital devices used in radiographic imaging must be able to represent more than one colour.

- c) Human vision can differentiate 32 gray levels.
 - d) Factors controlling the dynamic range are window level and window width.
5. Which of the following statements is not true concerning image processing?
- a) A computer usually uses 256 shades of gray to display an image.
 - b) An increase in window width results in decrease in image contrast.
 - c) The size of the window width (too narrow or too wide) has no effect on the information given by an image.
 - d) When a smaller range of densities is displayed, the image will have higher contrast.
6. Concerning digital imaging ethics,
- a) A user may make unethical alterations on an image without malicious intentions.
 - b) A photograph is assumed to be an accurate representation of events.
 - c) Scientists are believed to be respected sources of information.
 - d) Twelve guidelines have been developed to guide the acquisition, manipulation and use of digital images.
7. In medical forensic imaging;
- a) The X-ray is a useless tool.
 - b) Ultrasound can be used to assess damage to internal organs.
 - c) A person wearing metallic objects is not allowed to go into an MRI room.
 - d) CT Scan is a useful tool in detecting bullets lodged in soft tissues.
8. True or false
- a) X-rays were discovered in 1895 by Conrad Roentgen.
 - b) The first known Forensic radiograph is that done by Prof. A. W. Wright of Yale University in February 1896.
 - c) In the above case the cause of death of a rabbit was the main subject.
 - d) The first court case in North America involving X-rays was in Montreal Canada.
9. The following is true concerning forensic imaging today.
- a) Most forensic imaging today is done in the mortuary.
 - b) Conventional diagnostic X-ray is the most commonly used imaging equipment.
 - c) Most funeral homes do not have imaging facilities.
 - d) All the above is true.
10. Medical imaging in forensic is used to;
- a) Assess age
 - b) Demonstrate foreign bodies
 - c) Demonstrate damaged organs
 - d) To determine the cause of death.
11. In taking X rays, there are cardinal principles that must be observed.
- a) Time
 - b) Distance
 - c) Shielding
 - d) None of the above.

12. In Legal and ethical considerations of medical forensic imaging;
 - a) Patients information of the dead requires no confidentiality.
 - b) Forensic cases should always be regarded as 'subjudice'.
 - c) Anybody can produce the images in a court of Law.
 - d) All the above is true.
13. In presenting images in a court room,
 - a) Labeling of the images adds no value.
 - b) Images should be presented in a serial manner.
 - c) Once accepted by the court, images are labeled as exhibits.
 - d) Hard copies are tamperproof.
14. When taking images in a mortuary;
 - a) The Radiographer must abide by the relevant codes of conduct.
 - b) The dead are dead and not much care is required.
 - c) The radiographer must make all efforts to obtain good images.
 - d) All images must be taken in orthogonal planes, AP and Lateral.
15. While imaging in mass fatality events,
 - a) Images should be taken in as near ante-mortem situation as possible.
 - b) Images should provide optimal recorded details and proper visibility.
 - c) The image markers should be clear and visible.
 - d) Labeling must be optimal.
16. The following are examples of the value of imaging in forensic investigation.
 - a) Investigation of nonfatal injuries.
 - b) Location of forensic evidence.
 - c) Determination of cause of death.
 - d) Human identification.
17. The advantages of X-rays over other imaging modalities in forensic investigation are;
 - a) It is noninvasive.
 - b) It can be electronically transmitted.
 - c) The units can be mobile.
 - d) It is cheaper.
18. The following are Methods of image capture.
 - a) Single shot.
 - b) Multi shot.
 - c) Scanning
 - d) Drawing.
19. The following are methods one can use to transfer images.
 - a) USB.
 - b) Bluetooth
 - c) MMS.
 - d) SMS

20. Digital images can be printed;
- Using PictBridge standard.
 - Using wireless connection.
 - Using an inbuilt polaroid printer.
 - In the darkroom.

SECTION B: ANSWER ALL QUESTIONS (5 marks each).

- What is digital imaging? How is it applied in forensics?
- Outline the Ethics governing Digital Imaging.
- Discuss image processing Techniques.
- Outline the Advantages and disadvantages of Digital imaging.
- With the aid of a simple diagram discuss the parts of a simple bridge type Digital Camera.
- Write short notes on Forensic Medical imaging.

SECTION C : ANSWER ANY TWO QUESTIONS (20 marks each).

- Explain image resolution.
- Discuss Image data storage.
- The following is the history of forensics, fill in the gaps:

“The world of forensics has only recently captured the attention of the general public, largely due to works of fiction and television programs. These programs have enjoyed great popularity and focused world attention on today’s issues, but one has to remember that these are fictional situations designed to attract an audience and many times offeror What most people do not realize is that components of forensic sciences as we know the today actually existed Years before the birth of Christ. The ancient Babylonians recognized the distinctive characteristics of and used them on clay for business transactions. Thumb prints have also been found on clay seals in ancient In Egypt, pharaoh Zoser the first pharaoh of the third dynasty appointed a chief justice physician to investigate deaths. The earliest record a murder trial was found in inscribed on a clay tablet dating back around 1850 BC. And the Hammurabi code possibly