TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

UNIVERSITY EXAMINATIONS FOR DEGREE IN

BACHELOR OF SCIENCE IN ELECTRICAL AND ELECTRONIC ENGINEERING

EEE 2418: VISUAL DISPLAYS I

END OF SEMESTER EXAMINATIONS
SERIES: APRIL 2014
TIME: 2 HOURS

INSTRUCTIONS:

- You should have the following for this examination:
  - Answer booklet
  - Calculator
- Answer question **ONE (Compulsory)** and any other **TWO.**

This paper consists of Three printed pages

QUESTION 1 (Compulsory)

a) Define the following terms as applied to Television picture:
   i. Aspect ratio
   ii. Contrast **(2 marks)**

b) Explain horizontal resolution of a television system. Illustrate with a diagram. **(4 marks)**

c) A television standard has 819 scan lines and a frame scan rate of 25HZ with 2:1 interlace. Assuming 15% horizontal blanking time and a kell factor of 0.7, Find:
   i. The video bandwidth requirement of the system.
   ii. The vertical resolution **(5 marks)**

d) i) Explain the reason of using interlace scanning as opposed to sequential scanning scheme in Television systems.

ii) Using a labelled diagram, explain interlace scanning in television
iii) Show the time base waveforms for horizontal and vertical scanning. **(10 marks)**

e) i) Sketch the CCIR B (ITU-RB) standard composite video waveform for two horizontal scanning lines.
ii) Explain the functions of the back porch of the composite video signal. **(9 marks)**

QUESTION 2

a) Explain illustrating with diagrams, how video is produced by the target plates in vidicon camera pick-up tube. **(6 marks)**

b) Discuss the advantages of CCD imager in television camera over other pick-up devices. **(6 marks)**

c) i) Draw a block diagram of a vidicon camera showing how composite video signal is produced.

ii) Explain how the scanning time base system differ when interline transfer method is use for CCD imager from that used for vidicon tube. **(8 marks)**

QUESTION 3

a) State any **FOUR** functions of the r.f turner of a television receiver. **(4 marks)**

b) i) Draw a block diagram of a digital television receiver.
ii) Give the merits of digital techniques in television receiver over analogue schemes. **(16 marks)**

QUESTION 4

a) Explain the advantages of IF modulation over direct modulation in television transmission. **(5 marks)**

b) Explain the television broadcast transmission requirements in the service area of a television station. **(4 marks)**

c) Describe, using block diagrams, the operation of a television transmitter using IF modulation. **(11 marks)**

QUESTION 5

a) Compare and contrast the cathode ray tube (CRT) and TFT LCD technologies. **(4 marks)**

b) Explain the operation of the drive circuits for Active Matrix TFT LCD panels. Illustrate using a diagram. **(10 marks)**

c) i) State the facilities for program production and editing in a modern television studio complex.
ii) Draw a block diagram of the timing unit of a sync pulse generator and explain its purpose in a television studio. **(6 marks)**