FNU FIJI NATIONAL UNIVERSITY

College of Engineering, Science & Technology

CERTIFICATE IV IN ELECTRONIC ENGINEERING

EEE415 – ELECTRONIC COMMUNICATION SYSTEMS

FINAL EXAMINATION – TRIMESTER 2 - 2016.

TIME: TBA **DURATION: 3 HOURS** **Date: TBA**

INSTRUCTIONS TO STUDENTS:

1. You are allowed 10 minutes **EXTRA** as reading time during which you are **NOT** to write.
2. Begin each answer on a fresh page and use both sides of the sheet.
3. Write your candidate number at the top of each attached sheet.
4. Insert all written foolscap, graph paper, drawing paper, etc. in their correct sequence and secure well.
5. For all sheets of paper on which rough/draft work has been done, cross it through and attach to your answer scripts.
6. Show all workings where necessary
7. Diagrams and graphs can be drawn in pencil.
8. Non- programmable calculators are allowed.
9. **ATTEMPT ALL QUESTIONS**
10. **Check your work before you leave the room!!**

Section A (20 marks)

Question 1

a) What is communication in one sentence? **(1 mark)**
b) What are the basic components of a communication system? **(3 marks)**
c) Explain the function of these basic components? **(6 marks)**

Question 2

a) What are the 3 methods of communication? **(3 marks)**
b) What does the term Attenuation mean? **(2 marks)**
c) What does the term Noise mean? **(2 marks)**
d) What does the term Distortion mean? **(2 marks)**
e) What do you understand by the term Bandwidth? **(1 mark)**

Section B (20 marks)

Question 1

a) Explain with diagram how AM modulation works? **(6 marks)**
b) A standard AM broadcast station is allowed to transmit modulating frequencies up to 5 kHz. If the AM station is transmitting on a frequency of 980 kHz, what are sideband frequencies and total bandwidth? **(4 marks)**

Question 2

a) A filter has a power input of 50 mW and an output of 2 mW. What is the gain or attenuation? **(3 marks)**
b) An amplifier has an input of 3 mV and an output of 5 V. What is the gain in decibels? **(3 marks)**
c) Draw the block diagram of a Superheterodyne Receiver? **(4 marks)**

Section C (20 marks)

Question 1

a) Draw the block diagram for Digital modulation? **(3 marks)**
b) Explain ASK modulation with diagrams also? **(7 marks)**

Question 2

a) What does the acronym PABX mean? **(2 marks)**
b) Briefly explain the operation of a pabx in an organisation and the type of telephone numbers it can allocate? **(4 marks)**
c) What is SS7 and what is its purpose? **(4 marks)**

Section D (20 marks)

Question 1

a) What is the concept behind Cellular Communication working in a big geographical area? **(2 marks)**

b) What does the term ***"handoff"*** mean in Cellular Communication? **(2 marks)**

c) Draw a block diagram of an Advanced Mobile Phone System (AMPS) unit (cellular radio)? **(4 marks)**
d) When using digital cell phone system, what is the first requirement? **(2 marks)**

Question 2

a) What is an Optical communication system and what is the channel or medium used for this communication to occur? **(2 marks)**
b) Give 3 benefits of fiber-optic cable over conventional copper cables **(3 marks)**
c) Draw and label the typical layers of a fiber-optic cable? **(5 marks)**

Section E (20 marks)

Question 1

a) Name 3 types of antennas and their applications? **(6 marks)**
b) What are the three basic paths that a radio signal can take through space? **(3 marks)**
c) Give 1 problem that affects propagation? **(1 mark)**

Question 2

a) A noise generator using diode is required to produce 15uV noise voltage in a receiver circuit with an input impedance of 75Ω (purely resistive). The receiver has a noise power bandwidth of 220 kHz. Calculate the current through the diode? **(5 marks)**

b) A receiver has a noise power bandwidth of 12 kHz. A resistor with the receiver input impedance is connected across the antenna terminals. What is the noise power contributed by this resistor in the receiver bandwidth? Assume temperature to be 30 degrees celcius. **(5 marks)**

ALL THE BEST

==========THE END==========