Index Number: _____ Class: _____

UNIVERSITY OF ENERGY AND NATURAL RESOURCES, SUNYANI

SCHOOL OF ENGINEERING

DEPARTMENT OF COMPUTER AND ELECTRICAL ENGINEERING

LEVEL 300: MID SEMESTER EXAMINATION, 2017/2018

Bachelor of Science (Electrical and Electronics Engineering & Computer Engineering)

ELNG 302: Digital Mobile Communication

April, 2018 **Time: 40 minutes**

Materials required: Non-programmable calculator.
Instructions: Answer all questions.

Question 1

a. Briefly explain free space propagation model.

b. A unit gain antenna with a maximum dimension of 1 m produces 50 W power at 900 MHz. Find;

i. the transmit power in dBm and dB.

ii. the received power at a free space distance of 3m and 100m.

c. Explain the basic propagation mechanisms, which impact propagation in mobile communication.

Refraction
Diffraction
Scattering.

Question 2

In a mobile radio system, the propagation environment has a very strong impact on system design, and on overall capacity.

a. Describe the main factors that affect radio propagation, including fading. What are the main factors which influence propagation?

b. In transmission planning for a mobile radio system, describe the issues that need to be considered.

i. How are cell sizes chosen?

ii. Explain briefly the two major categories of channel allocation. - deals with allocation & assignment of

iii. How does the propagation environment affect cell planning?

Make a qualitative comparison between a rural environment and a city environment.

c. What is;

i. Co- channel interference? -

ii. Frequency reuse?

i. Handoff?

d. Distinguish between 1G and 2G cellular networks.