



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF SCIENCE IN COMPUTER ENGINEERING

SCE 508: MODERN COMMUNICATIONS

DATE: Monday, 16th April, 2012

TIME: 11.00 a.m. – 1.00 p.m.

INSTRUCTIONS:

Answer question **ONE** and any other **TWO** questions.

1. (a) State two differences between spontaneous emission and stimulated emission.

(2 marks)

(b) Explain how electron of a laser material is excited to higher state stating ways by which energy is transferred into it.

(3 marks)

(c) Energy band gap of LED material is 3.12 eV. Obtain the wavelength of the radiation emitted. $h=6.63 \times 10^{-34}$ Js; $c=3 \times 10^8$ m/s; $e=1.6 \times 10^{-19}$ J/eV

(3 marks)

(d) Explain why a satellite in Geostationary Earth Orbit (GEO) appears to be stationary?

(2 marks)

(e) What is the significance of satellites in communication?

(4 marks)

(f) Explain how optical signal is transmitted in an optic fibre.

(4 marks)

(g) Explain what is handover as applied in communication.

(2 marks)

(h) How is cellular different from non-cellular mode of mobile radio communication.

(2 marks)

(i) Define multiple access as used in satellite communication.

(2 marks)

- (j) Explain the limitations of computer internet. (3 marks)
- (k) State the operation of photoconductors in optic communication system. (3 marks)
2. (a) Explain why optical fibres are preferred to coaxial cables in communication. (4 marks)
- (b) What is the advantage of multimode transmission in optical fibre. (2 marks)
- (c) Explain how information is lost in optical fibres. (4 marks)
- (d) With aid of a diagram, explain the optical transmission system. (10 marks)
3. (a) Explain the advantages and disadvantages of cellular networks in mobile communication. (4 marks)
4. (b) Differentiate teletext and prestel as used in telephone for TV reception (2 marks)
- (c) Outline components in prestel mode of communication and explain its working mechanism. (10 marks)
- (d) Explain application of FSK and ASK. (4 marks)
5. (a) Explain any one radar method employed. (2 marks)
- (b) Explain any one charging method of radars. (8 marks)
- (c) Explain how radars are used to locate and measure movement of aircraft. (10 marks)
6. (a) Explain why uplink frequency is higher than downlink frequency in satellite communication. (2 marks)
- (b) Explain the developments and achievements of INTELSAT. (6 marks)
- (c) Explain what determines the altitude of a satellite. (2 marks)
- (d) Explain any two multiple access methods by which earth station shares satellites. (10 marks)