TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY (INFORMATION TECHNOLOGY)

EIT 4419: OPTICAL FIBRE COMMUNICATION SYSTEMS.

END OF SEMESTER EXAMINATION

SERIES: MAY 2016

TIME: 2HOURS

DATE: Pick Date MAY 2016

Instructions to Candidates
You should have the following for this examination
-Answer Booklet, examination pass and student ID
This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.
Do not write on the question paper.

Question ONE

(a) Describe the stages of manufacturing an optic fibre cable. (6 marks)
(b) Explain the following terms:
   i. PON.
   ii. CWDM system.
   iii. Entrance facility. (6 marks)
(c) Using a suitable diagram, describe the structure of an optical communication system and explain the functions of its components. (8marks)
(d) Outline any four areas application of optic fibre channels. (4 marks)
(e) Explain the main causes of attenuation in optic fibre channels. (6 marks)

Question TWO

(a) What is dispersion in Optic Fibre cable? (2 marks)
(b) State three types of Dispersion in Fibre cables. (4 marks)
(c) What is a dB? (2 marks)

(d) An optic fibre channel of 500km has an attenuation of 0.12dB/km. A total of four (4) optical amplifiers are used each having a gain of 10dB. If total loss due to bending and connectors is 5.5dB, find the amount of power transmitted into the fibre if the received power at the destination is 15dB. (10 marks)

Question THREE

(a) Discuss any four advantages of using optic fibre over copper cables for high data rate transmission.
(4 marks)
(b) Describe the optical spectrum. (6 marks)
(c) Contrast between graded-index and step-index optical fibres. (4 marks)
(d) Describe any three characteristics of a good LASER. (6marks)

Question FOUR

(a) Using a Suitable diagram, describe the optical network architecture. (10 marks)
(b) Describe SONET. (4 marks)
(c) Describe the components of a SONET link. (6marks)

Question FIVE

(a) Using suitable diagrams, describe two main topologies used in PONs. (8 marks)
(b) Distinguish between Upstream and Downstream as used in a PON. (4 marks)
(c) Explain the following terms:
    i. Lightpath.
    ii. Traffic Grooming. (4 marks)
(d) Using a suitable diagram, explain the concept of Wavelength routing. (4 marks)