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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

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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) Explain the following terms:
     i. Optical Distribution Network.
     ii. POP.
     iii. Refraction.
     iv. Drawing. (8 marks)

(b) Differentiate between Link protection and path protection. (6 marks)

(c) Describe the Optical Transport Network. (10 marks)

(d) Using a suitable diagram, distinguish between the following as used in a fibre channel:
     i. Physical link, a Virtual path and a Virtual circuit. (4 marks)
     ii. Virtual path Identifier and a Virtual circuit identifier. (2 marks)

Question TWO

(a) State three types of WDM Optical Rings. (3 marks)
(b) State any four types of PONs. (4 marks)
(c) Describe the structure and operation of a DWDM system. (8 marks)

(d) Two main types of optical sources in fibre networks are the LED and a LASER. Outline any five major differences between them. (5 marks)

Question THREE

(a) Describe the optic fibre hybrid systems used in the First Mile. (4 marks)

(b) Outline the benefits of each of the optic fibre hybrid systems you have described in question 3 (a) above. (4 marks)

(c) Distinguish between Inter-modal dispersion and Intra-modal dispersion in optic fibre channels. (4 marks)

(d) Outline the functions of:
     i.   Optical Transmitter.
    ii.   Optical Receiver. (8 marks)

Question FOUR

(a) Discuss the classifications of optic fibre cables. (5 marks)

(b) Briefly, outline the operation of an EPON. (6 marks)

(c) Describe the variation of attenuation of an optic fibre channel with increased frequency within the optical spectrum. (5 marks)

(d) Optical network is mainly a physical layer technology while IP is a layer three technology. Outline any two technologies are used over Optical network to carry IP traffic. (4 marks)

Question FIVE

(a) Using a suitable diagram, describe the structure of a PON. (8 marks)

(b) Explain the difference between Demodulation and Detection. (4 marks)

(c) Describe the three main standards used in optical communication systems. (6 marks)

(d) Explain the term 'sooting' as used in the manufacturing of an optic fibre cable. (2 marks)