



**EASTERN UNIVERSITY, SRI LANKA**  
**DEPARTMENT OF MATHEMATICS**  
**THIRD YEAR EXAMINATION IN SCIENCE - 2012/2013**  
**SECOND SEMESTER (Sept./Oct., 2015)**  
**CS 302 – COMPUTER NETWORKS**  
**(PROPER & REPEAT)**

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Answer all questions

Time allowed: 02 hours

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01.

- a) Define the terms *Networking* and *Internet* stating how they differ from one another.
- b) What are the two types of LAN network? Briefly explain with the aid of a diagram.
- c) List the advantages and disadvantages of the star topology.
- d) Write short notes on the following types of physical media:
  - i. Shielded twisted pair cable;
  - ii. Fiber optic cable;
  - iii. Satellite microwave;
  - iv. Coaxial cables;

02.

- a) What is the purpose of using standard models such as OSI in networking systems?
- b) Briefly describe the ISO-OSI reference model, stating the major responsibilities of each layer.
- c) Describe the process of data transmission via the layers of ISO-OSI reference model.
- d) The communication system is responsible for the transmission from the sender to the recipient. Explain three ways of data flow with respective examples.

03.

- a) The use of digital signals and modulation has great advantages over analog systems. Explain Why?
- b) Describe briefly different types of digital modulation techniques and discuss their drawbacks separately.
- c) Discuss the process of Two-Dimensional parity bit error detection method by using following data:  
**010110 1001010 0110100 0100101 1011000 1111011**
- d) Suppose a message frame is to be transmitted across a data link using a CRC for error detection and correction. If the generator polynomial is,  
 $G(x) = x^3 + 1;$ 
  - i. generate the CRC code for the message bit **1101011011**.
  - ii. find the actual bit stream.
  - iii. Suppose fourth bit from the left is inverted during transmission. Show that this error is detected at the receiver side.

04.

- a) Discuss the main concepts behind different types of switching.
- b) Briefly explain the process of Frequency Division Multiplexing (FDM).
- c) What are the drawbacks of frequency division multiplexing?
- d) Analyze the transmission of a data packet for a system that uses Stop and wait protocol for the following situations: (Use appropriate figures to support your answer.)
  - i. Lost or damaged frame;
  - ii. Lost acknowledgement;
  - iii. Delayed acknowledgement;