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## RAJARATA UNIVERSITY OF SRI LANKA
## FACULTY OF APPLIED SCIENCES

**B.Sc. (Information and Communication Technology) Degree**
**Second Year - Semester II Examination – November/December 2016**

### ICT 2305 – COMPUTER NETWORKS

**Time: Three (3) hours**

Answer All questions

**Q1.**  (a) List four advantages of computer networking. [4 Marks]

    (b) Explain the use of the following devices in computer networks:

       i.  NICs.

       ii.  Switches.

       iii. Bridges. [6 Marks]

    (c) Write short notes on each of the following:

       i.   Broadcast networks.

       ii.  Point-to-point networks [4 Marks]

    (d) Give illustrations of bus, ring and star network topologies. [6 Marks]

**Q2.**  (a) What do you mean by layered network architecture? [4 marks]

    (b) List the layers of the OSI reference model. [6 marks]

    (c) Explain the responsibilities of the transport layer of the OSI reference model. Why the transport layer is called a true end-to-end layer? [6 marks]

    (d) Relate the layers of the OSI reference model to the layers of the TCP/IP model. [4 marks]

**Q3.**  (a) What do you mean by error detection and error correction? [4 marks]

    (b) Explain the two types of bit errors in data transmission. [6 marks]

    (c) Describe the principle mechanism that is used in most of the error detection techniques. [6 marks]

    (d) Distinguish between "forward error correction" versus "error correction by retransmission". [4 marks]

**Q4.** (a) Explain the drawbacks of the character count method in framing. [5 marks]

(b) What is character-stuffing? Explain how the problem of occurring flag bit pattern in the data is handled in character-stuffing. [6 marks]

(c) The following character encoding is used in a data link protocol:

A : 01000111
B : 11100011
FLAG : 01111110
ESC : 11100000

Show the bit sequence transmitted (in binary) for the four-character frame: **A B ESC FLAG** when each of the following framing methods are used:

i. Character count.

ii. Flag bytes with character stuffing.

iii. Starting and ending flag bytes, with bit stuffing. [9 marks]

**Q5.** (a) Why IP is called "Best effort delivery" protocol? [4 marks]

(b) What is the difference between the IP Address and the Physical Address of a networked device? [4 marks]

(c) What is network mask? Give the default network marks for each of the network classes A, B, and C. [6 marks]

(d) Suppose an organization is given the IP block 17.12.14.0/26, which contains 64 addresses. The organization needs to divide this address block into three subnets of 32, 16 and 16 addresses. Find the network masks for each of the subnets. [6 marks]

**END**