BACHELOR OF COMPUTER APPLICATIONS (BCA) (Revised)
Term-End Examination
December, 2017

04931

BCS-041 : FUNDAMENTALS OF COMPUTER NETWORKS

Time : 3 hours   *Maximum Marks : 100*

Note : *Question no. 1 is compulsory. Answer any three questions from the rest.*

1. (a) Find CRC for the data polynomial $x^5 + x^4 + x^2 + 1$ with generator polynomial $x^3 + 1$.   7

   (b) Match the following to one or more layers of the OSI model. (Write the name(s) of layer(s))   4

   (i) Running FTP applications

   (ii) Managing congestion control

   (iii) Fragmentation and reassembly of packets

   (iv) Encryption/Decryption

   (c) How is sampling done from analog signals ? Explain through an illustration.   6

   (d) How many networks can each IP address class A, B and C have ? Also find the number of hosts per network in each given address class.   6

(e) The following Figure 1(a) is a subnet having six routers A, B, C, D, E and F.
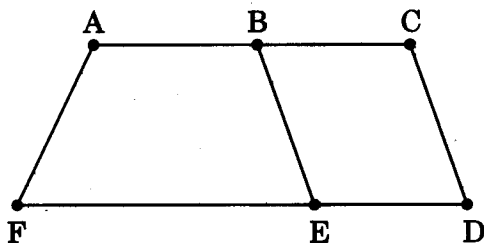

Figure 1(a) : A subnet

The first three columns in Figure 1(b) show the delay vectors received from neighbours of E (i.e., from B, D and F). Suppose that E has also measured its delay to neighbours B, D and F.

				E	
To	B	D	F	Delay	Link
A	4	3	5	–	–
B	0	6	10	6	B
C	8	9	15	–	–
D	12	0	20	8	D
E	16	12	25	0	
F	20	15	0	7	F

Figure 1(b) : Delay vectors

Show how the router E calculates its delay to A and C.   10

(f) What is a Congestion Control Mechanism ? Discuss slow start phase of TCP's congestion control mechanism through an illustration. 7

2. (a) State *True/False*. 5

(i) Data transmission has a high signal quality in an analog system compared to a digital system.

(ii) In synchronous transmission, there is no use of start and stop bits.

(iii) In comparison to asynchronous communication, synchronous communication has higher speeds.

(iv) Telephone/mobile conversation is an example of half duplex transmission.

(v) Walkie-talkie device is an example of half duplex channel.

(b) What do 10 Base T and 100 Base T stand for ? Also differentiate between the two. 5

(c) Compare ring topology and mesh topology in terms of the following parameters : 6

(i) Requirement of cable

(ii) Reliability

(iii) Performance of a network by adding extra nodes

(d) How do ARP and RARP work ? 4

3. (a) What are the important features of an ATM switch ? *4*

(b) What is Count-to-Infinity Problem ? Explain. *6*

(c) Discuss the following in context of network management : *6*

  (i) Configuration management

  (ii) Accounting management

(d) Explain the multiplicative decrease process with respect to congestion control. *4*

4. (a) What is Silly Window Syndrome ? What are the proposed solutions to this syndrome ? *6*

(b) What are the two categories of ICMP messages ? Give two examples of each. *6*

(c) Differentiate between virtual circuit and datagram. *3*

(d) Explain the following features of IPv6 : *5*

  (i) Tunnelling

  (ii) Dual IP stack

5. (a) (i) Given the network address 125.0.0.0., find the class, the block and the range of the address. *3*

  (ii) How can we prove that we have 2,147,483,648 addresses in Class A ? *2*

(b) What are the pros and cons of a wireless communication system ? 5

(c) How does MD5 message digest algorithm work ? Explain. 6

(d) Explain the following terms : 4
- Decryption
- Cryptography