KUMARAGURU college of technology
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Register Number: …….

B.TECH DEGREE EXAMINATIONS: APRIL/MAY 2016

(Regulation 2013)

Sixth Semester

INFORMATION TECHNOLOGY

U13ITT603**:** TCP/IP and Socket Programming

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. SOCK_STREAM in the Internet domain uses _____

   a) SMTP b) IP
   c) TCP d) ARP

2. The _____socket function retrieves host information corresponding to a host name from a host database.

3. Which of the following is not used with datagram sockets?

   a) Connect( ) b) send()
   c) recv() d) Listen( )

4. The Sockets layer sits on top of the_____layer.

5. How many parameters must be passed to define the type of socket to be created?

   a) 3 b) 2
   c) 1 d) 5

6. _____is the final call made by servers to accept incoming client connections

7. Which of the following is true with respect to IP protocol.

   a) Unreliable b) Connectionless
   c) Both unreliable and connectionless d) Connection oriented

8. The bytes of data being transferred in each connection are numbered by TCP. The numbering starts with a _____.

9. Which of the following is true about ICMP messages?

   a) An ICMP error message may be generated for an ICMP error message
   b) An ICMP error message may be generated for each fragment
   c) An ICMP error message may be generated for a multicast datagram
   d) An ICMP error message may be generated for a unicast datagram

10. The connection establishment procedure in TCP is susceptible to a serious security problem called the _____ attack.

PART B (10 x 2 = 20 Marks)
(Answer not more than 40 words)

11. Write the prototype for the bind function.
12. Create a socket address that permits incoming connections on any interface and port 48000
13. Connecting sockets is usually not symmetric. Justify?
14. Distinguish between MSG_OOB and MSG_DONTROUTE
15. A packet has arrived with an M bit value of 0. Is this the first fragment, the last fragment, or a middle fragment? How do you know if the packet was fragmented?
16. What is silly window syndrome?
17. What is the purpose of including the IP header and the first 8 bytes of datagram data in the error reporting ICMP messages?
18. An IP datagram is carrying a TCP segment destined for address 130.14.16.17. The destination port address is corrupted and it arrives at destination 130.14.16.19.How does the receiving TCP react to this error?
19. Match the following to one or more layers of the OSI model:
    a) route determination
    b) flow control
    c) interface to transmission media
    d) provides access for the end use
20. What is the size of an ARP packet when the protocol is IP and the hardware is Ethernet?

PART C (5 x 14 = 70 Marks)
(Answer not more than 400 words)

Q.No. 21 is Compulsory

21. An ISP is granted a block of addresses starting with 190.100.0.0/16 (65,536 addresses). The ISP needs to distribute these addresses to three groups of customers as follows:
    (i) The first group has 64 customers, each needs 256 address.
    (ii) The second group has 128 customers, each needs 128 address.
    (iii) The third group has 128 customers, each needs 64 address.
    Design a sub block and find out how many addresses are still available after these allocation.

22. (a) (i) Explain the connections establishment, data transfer and connection termination phases in TCP. (10)
    (ii) A sender sends a series of packets to the same destination using 5-bit sequence of numbers. If the sequence number starts with 0, what is the sequence number of the 100^{th} packet? (4)

(OR)

(b) (i) Explain Karn's algorithm in detail. (7)
(ii) Illustrate the general form of an IPv6 datagram. (7)

23. (a) (i) Sketch the format of ARP packet. (6)

(ii) A router with IP address 195.5.2.12 and Ethernet physical address AA:25:AB:1F:67:CD has received a packet for a destination with IP address 185.11.78.10. When the router checks its routing table, it finds out the packet should be delivered to a router with IP address 195.5.2.6 and Ethernet physical address AD:34:5D:4F:67:CD. (8)

a) Show the entries in the ARP request packet sent by the router. Assume no subnetting.

b) Show the entries in the ARP packet sent in response to part a.

c) Encapsulate the packet made in part a in the data link layer. Fill in all the fields.

d) Encapsulate the packet made in part b in a data link frame. Fill in all the fields.

(OR)

(b) (i) Sketch the general format of ICMP messages. (4)

(ii) An ICMP message has arrived with the header (in hexadecimal): (10)

05 00 11 12 11 0B 03 02

a) What is the type of the message?
b) What is the code?
c) What is the purpose of the message?
d) What is the value of the last 4 bytes?
e) What do the last bytes signify?

24. (a) (i) Implement TCP echo server using stream socket. (8)

(ii) Write short notes on the following: (6)

a) The getsockopt and setsockopt functions
b) The fcntl functions
c) The ioctl functions

(OR)

(b) (i) Implement a Multi-threaded TCP Server using client-server socket programming (7)

(ii) Explain the process of creating a Raw Socket and list its limitations. (7)

25. (a) (i) Illustrate the UDP client server communication using typical functions calls. (7)

(ii) Distinguish between gethostbyaddr and gethostbyname functions (7)

(OR)

(b) (i) Explain briefly about Generic socket options. (6)

(ii) Write short notes on (8)

a) TCP_KEEPALIVE
b) TCP_MAXRT
c) TCP_MAXSIZE
d) TCP_NODELAY Socket Option

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