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| **18CSC302J-COMPUTER NETWORKS** |
| **QUESTION BANK**  **UNIT-I** |

**(MULTIPLE CHOICE QUESTIONS)**

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| **S.NO** | **QUESTION** | **BLOOMS LEVEL** |
|  | Protocol used for mapping the physical addresses to logical address is   1. ARP 2. RARP 3. ICMP 4. IGMP   ANSWER: B | L1 |
|  | Protocol used to resolve the logical address to an ethernet address   1. ARP 2. RARP 3. ICMP 4. IGMP   ANSWER: A | L1 |
|  | UDP provides additional services over Internet Protocol   1. Routing and switching 2. Sending and receiving of packets 3. Multiplexing and demultiplexing 4. Demultiplexing and error checkin   ANSWER: D | L1 |
|  | The transport layer protocol used for real time multimedia   1. TCP 2. UDP 3. ARP 4. RARP   ANSWER: B | L1 |
|  | One of the header fields in an IP datagram used to prevent packet looping   1. Header checksum 2. Fragment Offset 3. TOL 4. TOS   ANSWER: C | L2 |
|  | ICMP always reports error messages to   1. Destination 2. Router 3. Source 4. Previous router   ANSWER: C | L1 |
|  | Host A sends a datagram to Host B with size 7000 which is routed through router R1. Ethernet is used for transmission where MTU is 1500. How many fragments will be generated?  a. 4  b. 5  c. 6  d. 7  ANSWER: b | L1 |
|  | Which program is used to find a host is live and responding during debugging   1. Ping 2. Shell 3. Traceroute 4. Tracert   ANSWER: A | L2 |
|  | Command used to trace the path of a packet from the source to destination in windows   1. Ping 2. Locater 3. Traceroute 4. Tracert   ANSWER: D | L2 |
|  | No ICMP error message will be generated for a datagram for a \_\_\_ Address   1. Unicast 2. Multicast 3. Physical 4. Logical   ANSWER: B | L1 |
|  | What is the maximum packet size of IP PROTOCOL?  a. 65,536 bytes  b. 1220 bytes  c. 65,535 bytes  d. 64 bytes  ANSWER: c | L1 |
|  | Field that is used to detect errors over the entire user datagram   1. Checksum 2. source port 3. udp header 4. destination port   ANSWER: A | L1 |
|  | If the value in the protocol field is 6, The transport layer protocol used is   1. TCP 2. UDP 3. ICMP 4. IGMP   ANSWER: B | L2 |
|  | The field that helps to check rearrangement of fragments   1. Flag 2. TTL 3. TOS 4. Offset   ANSWER: D | L1 |
|  | The traffic class field is used to specify the priority of the IP packet which is a similar functionality to the \_\_\_field in the IPv4 header   1. TOS 2. TTL 3. Flag 4. Offset   ANSWER: A | L2 |
|  | An Ethernet multicast physical address is in the range of \_\_\_\_\_\_\_\_  a. 02:00:5E:00:00:00 to 01:00:5E:7F:FF:FF.  b. 01:00:5E:00:00:00 to 02:00:5E:7F:FF:FF.  c. 02:00:5E:00:00:00 to 01:00:5E:7F:FF:FF.  d. 01:00:5E:00:00:00 to 01:00:5E:7F:FF:FF.  ANSWER: D | L1 |
|  | IPv6 packet can live up to \_\_\_ router hops   1. 256 2. 512 3. 255 4. 511   ANSWER: C | L1 |
|  | Internet Group Management Protocol (IGMP) relates to   1. Session Layer 2. Transport Layer 3. Network Layer 4. Data link Layer   ANSWER: C | L1 |
|  | The maximum transmission unit value for FDDI ring is   1. 1500 2. 2552 3. 4352 4. 2343   ANSWER: C | L2 |
|  | An ARP packet is encapsulated directly into \_\_\_\_ Frame   1. Physical 2. Network 3. Data link 4. Transport   ANSWER: C | L1 |
|  | Identify the debugging tool which is used to find if a host is alive or responding  a. ping  b. traceroute  c. FTP  d. UDP  ANSWER: a | L1 |
|  | The protocol used to create sub netting effect   1. ARP 2. RARP 3. ICMP 4. Proxy ARP   ANSWER: A | L1 |
|  | Number of socket addresses needed to use the services of UDP   1. 1 2. 2 3. 3 4. 4   ANSWER: B | L1 |
|  | Server program informs TCP that it is ready to close connection is called as \_\_\_\_  a. Active close  b. Passive close  c. Active open  d. Passive open  ANSWER: B | L1 |
|  | UDP packets are encapsulated in the form of   1. Data link frame 2. Ethernet frame 3. TCP segment 4. IP datagram   ANSWER: D | L1 |
|  | Which of the following is not a component of an ARP package   1. Cache table 2. Cache control module 3. Checksum 4. Queues   ANSWER: C | L2 |
|  | The length of logical address in TCP/IP is   1. 64 bits 2. 32 bits 3. 48 bits 4. 16 bits   ANSWER: b | L1 |
|  | Two protocols can be used instead of RARP   1. DHCP and ICMP 2. Boot and ICMP 3. IGMP and ICMP 4. DHCP and Boot   ANSWER: D | L1 |
|  | Additional services provided by the UDP protocol over Internet Protocol is   1. Demultiplexing and error checking 2. Routing and switching 3. Multiplexing and demultiplexing 4. Sending and receiving of packets   ANSWER: C | L1 |
|  | Which field helps to check rearrangement of the fragments?  A. offset  B. Flag  C. Identifier  D. TTL  ANSWER: A | L1 |
|  | IP is a .................... Datagram  A. unreliable  B. static  C. connection oriented  D. reliable  ANSWER: A | L1 |
|  | Select the bit size of the cumulative acknowledgement   1. 64 bits 2. 32 bits 3. 16 bits 4. 8 bits   ANSWER: b | L1 |
|  | In \_\_\_\_\_\_\_\_\_, there is one source and a group of destinations  a.Unicasting  b.Multicasting  c.Broadcasting  d.Multitasking  Answer: b | L1 |
|  | Identify the Multicast applications  a.Audio streams  b.Teleconferencing  c.Video streams  d. Text related documents  Answer:b | L2 |
|  | Identify the block which is called Stream Multicast Group Block  a.224.10.0.0/16  b.224.111.0.0/16  c. 224.1.11.0/16  d. 224.1.0.0/16  Answer:d | L2 |
|  | \_\_\_\_\_\_\_\_allows multiple IP addresses for each end   1. SCTP association 2. TCP association 3. UDP association 4. FTP association   Answer: a | L1 |
|  | The connection establishment in TCP is called \_\_\_\_\_\_\_  a.Three-way handshaking  b.Two way handshaking  c. One way handshaking  d.Four way handshaking  Answer: a | L1 |
|  | Identify the stream-oriented protocol  a.UDP  b.FTP  c.TCP  d.ICMP  Answer: c | L2 |
|  | \_\_\_\_\_segment consumes one sequence number if it does not carry data  a.FIN  b.ACK  c.PSH  d.TCP  Answer: a | L1 |
|  | Identify the heart of the error control mechanism.  a.Segments  b.Frame  c.Datagram  d. Retransmission of segments  Answer: a | L2 |
|  | Which protocol can be best modeled as a Selective Repeat protocol.  a.IP  b.FTP  c.TCP  d. UDP  Answer: C | L2 |
|  | Find out actual window size.  a minimum (cwnd)  b. minimum (rwnd)  c. maximum (rwnd, cwnd)  d. minimum (rwnd, cwnd)  Answer: C | L2 |
|  | In the \_\_\_\_\_\_\_ algorithm, the size of the congestion window increases exponentially until it reaches a threshold  a. Slow start  b. RTT  c.MSS  d.CWND  Answer: a | L1 |
|  | \_\_\_\_\_\_\_balances the rate a producer creates data with the rate a consumer can use the data.  a.Error Control  b. Flow control  c.Checksum  d. Congestion control  Answer: b | L1 |
|  | Which of the following protocols uses both TCP and UDP?  a.FTP  b.SMTP  c.Telnet  d.DNS  Answer: d | L2 |
|  | Which is used to check for a corrupted segment  a.FIN  b.Error  c.ACK  d. Checksum field  Answer: d | L2 |
|  | \_\_\_\_\_\_reports a block of data that is out of order.  a. SACK  b.ACK  c. Cumulative Acknowledgement  d.FIN  Answer: a | L1 |
|  | Identify the solution proposed to prevent the silly window syndrome  a.Additive Increase  b.Multiplicative Decrease  c.Clark’s solution  d. Slow start  Answer: c | L2 |
|  | A serious problem can arise in the \_\_\_\_\_\_\_\_\_\_\_when either the sending application program creates data slowly or the receiving application program consumes data slowly, or both.  a. Sliding window operation  b. silly window syndrome  c. Additive Increase  d.Multiplicative Decrease  Answer: a | L1 |
|  | Delaying the acknowledgment provides solution for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  a. Sliding window operation  b. silly window syndrome  c. Additive Increase  d. Multiplicative Decrease  Answer: b | L1 |
|  | Identify the protocol that uses multicast link state routing to create source-based trees.  a. Multicast Open Shortest Path First  b. Multicast Shortest path first  c. Multicast Open Shortest Path  d. Multicasting  Answer: b | L2 |
|  | \_\_\_\_\_\_\_\_\_\_broadcasts packets, but creates loops in the systems.  a. Unicasting  b. Multicasting  c. Flooding  d. Broadcasting  Answer: c | L1 |
|  | Which of the following are TCP/IP protocols used at the Application layer of the OSI model?  IP  TCP  Telnet  FTP  TFTP  a.1 and 3  b.1, 3 and 5  c.3, 4 and 5  d. 1 and 2  Answer: c | L2 |
|  | A TCP packet is called as \_\_\_\_\_  a.Datagram  b.Frame  c.Segment.  d.Packet  Answer: c | L1 |
|  | Which of the following are layers in the TCP/IP model?  1.Application  2.Session  3.Transport  4.Internet  5.Data Link  6.Physical  a.1 and 2  b.1, 3 and 4  c.2, 3 and 5  d.3, 4 and 5  Answer: b | L2 |
|  | Identify the packet that is encapsulated in IP  a. Datalink frame  b.TCP packet  c. Frame  d. Physical layer packet  Answer: b | L2 |
|  | Which protocol conserves the message Boundaries  a.UDP  b.TCP  c.FTP  d. SMTP  Answer: a | L2 |
|  | **10 Marks** |  |
| **S.NO** | **QUESTION** | **BLOOMS LEVEL** |
| **1** | **Explain in detail about the TCP/IP protocol suite with a neat diagram.** | **L1** |
| **2** | **Summarize the need for IP Fragmentation & Reassembly.** | **L1** |
| **3** | **An IP datagram has arrived with the following information in the header (in hexa-decimal): 45 00 00 54 00 03 00 00 20 06 00 00 7C 4E 03 02 B4 0E 0F 02**  **a. Are there any options?**  **b. Is the packet fragmented?**  **c. What is the size of the data?**  **d. Is a checksum used?**  **e. How many more routers can the packet travel to?**  **f. What is the identiﬁcation number of the packet?**  **g. What is the type of service?**  **Answer:**  a. Since HLEN is 5, there is no option  b. The packet is not fragmented because the offset value is 0 and the ﬂags value is 0  c. The size of the data is 54 – 20 = 34 bytes  d. No checksum is used  e. The packet can travel to 20 more routers  f. The identiﬁcation number of this packet is 0003  g. The type of service is normal (0)    **Source Address: 0x7C4E0302 = 124.78.3.2**  **Destination Address: 0xB40E0F02 = 180.14.15.2** | **L3** |
| **4** | **Explain in detail about the format of an ARP packet and Proxy ARP?** | **L1** |
| **5** | How Address Resolution Protocol (ARP) works? Explain the 4 cases in detail. | **L1** |
| **6** | Elaborate in detail ARP and RARP Package with neat diagram. | **L2** |
| **7** | **i)In a datagram, the M bit is zero, the value of HLEN is 5, the value of total length is 200, and the offset value is 200. What is the number of the ﬁrst byte and number of the last byte in this datagram? Is this the last fragment, the ﬁrst fragment, or a middle fragment?**  **Answer:**  Since HLEN is 5 then there is no option so the header length is 20 bytes. Knowing the total length 200 bytes we can ﬁnd the data length which is 200 - 20 = 180 bytes.  Since the offset is 200 then the ﬁrst byte in this fragment is 200\*8 = 1600 bytes. The last byte number is 1600+ 180 - 1 = 1779. Since M=0 then it’s the last fragment  **ii)If the original timestamp is 46, receive timestamp is 59 and transmit timestamp is 60, return time is 67 then Compute the round trip time and Time difference.**  **Answer:**  **Round Trip time = Sending time + receiving time**  **= (59-46) +(67-60)**  **= (13+7 ) = 20**  **RTT = 7**  **Time difference =receive time stamp –(Original time stamp + one way RTT (RTT/2))**  **= 59- (46 + (20/2))**  **= 59 –(46+10) = 3** | **L3** |
| **8** | Explain the use of Internet Control Message Protocol (ICMP) in detail | **L1** |
| **9** | Outline the message format of Internet Control Message Protocol (ICMP) in detail | **L1** |
| **10** | **Calculate the checksum for the following ICMP packet:**  **Type: Echo Request**  **Identiﬁer: 123**  **Sequence number: 25**  **Message: HELLO**  **Assume that message is divided into 8-bits(1 bytes)**  **Steps:**  **1. The checksum ﬁeld is set to zero.**  **2. The sum of all the 16-bit words (header and data) is calculated.**  **3. The sum is complemented to get the checksum.**  **4. The checksum is stored in the checksum ﬁeld.**  **Answer:**  Type = 8 and Code = 0-------------------------------  Identiﬁer = 123 = 7B in hex  Sequence number = 25 = 19 in hex  Each character is represented as 1 byte and we have to group these in 16 bits or 2 bytes  H and E = 48 and 45 respectively = 4845 in hex  L and L = 4C and 4C respectively = 4C4C in hex  O and 0 = 4F and 0 respectively = 4F00 in hex  So Add these in 16 bits chunk in order to get checksum = 0800+007B+0019+4845+4C4C+4F00 = EC25  checksum = 1's complement of EC25 = FFFF-EC25 = 13DA in hex | **L3** |
| **11** | **Suppose two packets arrive at two different input ports of a router at exactly the same time. Also suppose there are no other packets anywhere in the router.**  **a. Suppose the two packets are to be forwarded to two different output ports. Is it possible to forward the two packets through the switch fabric at the same time when the fabric uses a shared bus?**  **b. Suppose the two packets are to be forwarded to two different output ports. Is it possible to forward the two packets through the switch fabric at the same time when the fabric uses switching via memory?**  **c. Suppose the two packets are to be forwarded to the same output port. Is it possible to forward the two packets through the switch fabric at the same time when the fabric uses a crossbar?**  **Answer:(Need to explain elaborate)**  **Hint:**  a) No, you can only transmit one packet at a time over a shared bus.  b) No, as discussed in the text, only one memory read/write can be done at a time over the shared system bus.  c) No, in this case the two packets would have to be sent over the same output bus at the same time, which is not possible. | **L1** |
| **12** | **i)Distinguish UDP header and TCP header in detail. List the fields in the TCP header that are missing in the UDP header. Give the reasons for their absence.**  **ii)If an application needs to protect the boundaries of its message, which protocol should be used, UDP or TCP? Discuss.** | **L1** |
| **13** | Explain how TCP handles error control and flow control. | **L1** |
| **14** | Compare Multicast & Multicast Routing Protocols in detail | **L1** |
| **15** | Outline the importance of Stream Control Transmission Protocol | **L1** |