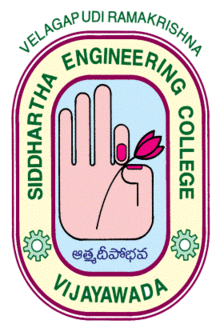
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**20IT5301: COMPUTER NETWORKS HOME ASSIGNMENT-2 QUESTIONS**

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| --- | --- | --- | --- |
| S.No | Question | CO | BTL |
| 1. | True or false? a. A user requests a Web page that consists of some text and three images. For this page, the client will send one request message and receive four response messages.  b. Two distinct Web pages (for example, www.mit.edu/research.html and www.mit.edu/students.html) can be sent over the same persistent connection.  c. With nonpersistent connections between browser and origin server, it is possible for a single TCP segment to carry two distinct HTTP request messages.  d. The Date: header in the HTTP response message indicates when the object in the response was last modified. e. HTTP response messages never have an empty message body. | CO3 | Analyse |
| 2. | Read RFC 959 for FTP. List all of the client commands that are supported by the RFC | CO3 | Analyse |
| 3. | Consider an HTTP client that wants to retrieve a Web document at a given URL. The IP address of the HTTP server is initially unknown. What transport and application-layer protocols besides HTTP are needed in this scenario? | CO3 | Analyse |
| 4. | Consider the following string of ASCII characters that were captured by Wireshark when the browser sent an HTTP GET message (i.e., this is the actual content of an HTTP GET message). The characters are carriage return and line-feed characters (that is, the italized character string in the text below represents the single carriage-return character that was contained at that point in the HTTP header). Answer the following questions, indicating where in the HTTP GET message below you find the answer  GET /cs453/index.html HTTP/1.1Host: gai a.cs.umass.eduUser-Agent: Mozilla/5.0 ( Windows;U; Windows NT 5.1; en-US; rv:1.7.2) Gec ko/20040804 Netscape/7.2 (ax) Accept:ex t/xml, application/xml, application/xhtml+xml, text /html;q=0.9, text/plain;q=0.8,image/png,\*/\*;q=0.5 Accept-Language: en-us,en;q=0.5AcceptEncoding: zip,deflateAccept-Charset: ISO -8859-1,utf-8;q=0.7,\*;q=0.7Keep-Alive: 300 Connection:keep-alive a. What is the URL of the document requested by the browser? b. What version of HTTP is the browser running? c. Does the browser request a non-persistent or a persistent connection? d. What is the IP address of the host on which the browser is running? e. What type of browser initiates this message? Why is the browser type needed in an HTTP request message? | CO3 | Analyse |
| 5. | The text below shows the reply sent from the server in response to the HTTP GET message in the question above. Answer the following questions, indicating where in the message below you find the answer. 172 CHAPTER 2 • APPLICATION LAYER HTTP/1.1 200 OKDate: Tue, 07 Mar 2008 12:39:45GMTServer: Apache/2.0.52 (Fedora) Last-Modified: Sat, 10 Dec2005 18:27:46 GMTETag: “526c3-f22-a88a4c80”AcceptRanges:bytesContent-Length:3874 Keep-Alive: timeout=max=100Connection: Keep-AliveContent-Type: text/html; charset= ISO-8859-1 a. Was the server able to successfully find the document or not? What time was the document reply provided? b.When was the document last modified? c. How many bytes are there in the document being returned? d. What are the first 5 bytes of the document being returned? Did the server agree to a persistent connection | CO3 | Analyse |
| 6. | Obtain the HTTP/1.1 specification (RFC 2616). Answer the following questions: a. Explain the mechanism used for signaling between the client and server to indicate that a persistent connection is being closed. Can the client, the server, or both signal the close of a connection? b. What encryption services are provided by HTTP? c. Can a client open three or more simultaneous connections with a given server? d. Either a server or a client may close a transport connection between them if either one detects the connection has been idle for some time. Is it possible that one side starts closing a connection while the other side is transmitting data via this connection? Explain. | CO3 | Analyse |
| 7. | Suppose within your Web browser you click on a link to obtain a Web page. The IP address for the associated URL is not cached in your local host, so a DNS lookup is necessary to obtain the IP address. Suppose that n DNS servers are visited before your host receives the IP address from DNS; the successive visits incur an RTT of RTT1, . . ., RTTn. Further suppose that the Web page associated with the link contains exactly one object, consisting of a small amount of HTML text. Let RTT0 denote the RTT between the local host and the server containing the object. Assuming zero transmission time of the object, how much time elapses from when the client clicks on the link until the client receives the object? | CO3 | Analyse |
| 8. | Referring to Problem P7, suppose the HTML file references eight very small objects on the same server. Neglecting transmission times, how much time elapses with a. Non-persistent HTTP with no parallel TCP connections? b. Non-persistent HTTP with the browser configured for 5 parallel connections? c. Persistent HTTP? | CO3 | Analyse |
| 9. | Consider Figure 2.12, for which there is an institutional network connected to the Internet. Suppose that the average object size is 850,000 bits and that the average request rate from the institution’s browsers to the origin servers is 16 requests per second. Also suppose that the amount of time it takes from when the router on the Internet side of the access link forwards an HTTP request until it receives the response is three seconds on average (see Section 2.2.5). Model the total average response time as the sum of the average access delay (that is, the delay from Internet router to institution router) and the average Internet delay. For the average access delay, use Δ/(1 – Δ), where Δ is the average time required to send an object over the access link and is the arrival rate of objects to the access link. a. Find the total average response time. b. Now suppose a cache is installed in the institutional LAN. Suppose the miss rate is 0.4. Find the total response time | CO3 | Analyse |
| 10. | Consider a short, 10-meter link, over which a sender can transmit at a rate of 150 bits/sec in both directions. Suppose that packets containing data are 100,000 bits long, and packets containing only control (e.g., ACK or handshaking) are 200 bits long. Assume that N parallel connections each get 1/N of the link bandwidth. Now consider the HTTP protocol, and suppose that each downloaded object is 100 Kbits long, and that the initial downloaded object contains 10 referenced objects from the same sender. Would parallel downloads via parallel instances of non-persistent HTTP make sense in this case? Now consider persistent HTTP. Do you expect significant gains over the non-persistent case? Justify and explain your answer. | CO3 | Analyse |
| 11. | Consider the scenario introduced in the previous problem. Now suppose that the link is shared by Bob with four other users. Bob uses parallel instances of non-persistent HTTP, and the other four users use non-persistent HTTP without parallel downloads. a. Do Bob’s parallel connections help him get Web pages more quickly? Why or why not? b. If all five users open five parallel instances of non-persistent HTTP, then would Bob’s parallel connections still be beneficial? Why or why not? | CO3 | Analyse |
| 12. | Write a simple TCP program for a server that accepts lines of input from a client and prints the lines onto the server’s standard output. (You can do this by modifying the TCPServer.py program in the text.) Compile and execute your program. On any other machine that contains a Web browser, set the proxy server in the browser to the host that is running your server program; also configure the port number appropriately. Your browser should now send its GET request messages to your server, and your server should display the messages on its standard output. Use this platform to determine whether your browser generates conditional GET messages for objects that are locally cached. | CO3 | Analyse |
| 13. | What is the difference between MAIL FROM: in SMTP and From: in the mail message itself? | CO3 | Analyse |
| 14. | How does SMTP mark the end of a message body? How about HTTP? Can HTTP use the same method as SMTP to mark the end of a message body? Explain. | CO3 | Analyse |
| 15. | Read RFC 5321 for SMTP. What does MTA stand for? Consider the following received spam email (modified from a real spam email). Assuming only the originator of this spam email is malacious and all other hosts are honest, identify the malacious host that has generated this spam email. From - Fri Nov 07 13:41:30 2008 Return-Path: Received: from barmail.cs.umass.edu (barmail.cs.umass.edu [128.119.240.3]) by cs.umass.edu (8.13.1/8.12.6) for ; Fri, 7 Nov 2008 13:27:10 -0500 174 CHAPTER 2 • APPLICATION LAYER Received: from asusus-4b96 (localhost [127.0.0.1]) by barmail.cs.umass.edu (Spam Firewall) for ; Fri, 7 Nov 2008 13:27:07 -0500 (EST) Received: from asusus-4b96 ([58.88.21.177]) by barmail.cs.umass.edu for ; Fri, 07 Nov 2008 13:27:07 -0500 (EST) Received: from [58.88.21.177] by inbnd55.exchangeddd.com; Sat, 8 Nov 2008 01:27:07 +0700 From: "Jonny" To: Subject: How to secure your savings | CO3 | Analyse |
| 16. | Read the POP3 RFC, RFC 1939. What is the purpose of the UIDL POP3 command? | CO3 | Analyse |
| 17. | a. What is a whois database? b. Use various whois databases on the Internet to obtain the names of two DNS servers. Indicate which whois databases you used. c. Use nslookup on your local host to send DNS queries to three DNS servers: your local DNS server and the two DNS servers you found in part (b). Try querying for Type A, NS, and MX reports. Summarize your findings. d. Use nslookup to find a Web server that has multiple IP addresses. Does the Web server of your institution (school or company) have multiple IP addresses? e. Use the ARIN whois database to determine the IP address range used by your university. f. Describe how an attacker can use whois databases and the nslookup tool to perform reconnaissance on an institution before launching an attack. g. Discuss why whois databases should be publicly available. | CO3 | Analyse |
| 18. | Suppose you can access the caches in the local DNS servers of your department.  Can you propose a way to roughly determine the Web servers (outside your  department) that are most popular among the users in your department? Explain. | CO3 | Analyse |
| 19. | Suppose that your department has a local DNS server for all computers in the department. You are an ordinary user (i.e., not a network/system administrator). Can you determine if an external Web site was likely accessed from a computer in your department a couple of seconds ago? Explain. | CO3 | Analyse |
| 20. | Consider distributing a file of F = 15 Gbits to N peers. The server has an upload rate of us = 30 Mbps, and each peer has a download rate of di = 2 Mbps and an upload rate of u. For N = 10, 100, and 1,000 and u = 300 Kbps, 700 Kbps, and 2 Mbps, prepare a chart giving the minimum distribution time for each of the combinations of N and u for both client-server distribution and P2P distribution. | CO3 | Analyse |
| 21. | Consider distributing a file of F bits to N peers using a client-server architecture. Assume a fluid model where the server can simultaneously transmit to multiple peers, transmitting to each peer at different rates, as long as the combined rate does not exceed us . a. Suppose that us /N ≤ dmin. Specify a distribution scheme that has a distribution time of NF/us . b. Suppose that us /N ≥ dmin. Specify a distribution scheme that has a distribution time of F/ dmin. c. Conclude that the minimum distribution time is in general given by max{NF/us , F/ dmin}. | CO3 | Analyse |
| 22. | Consider distributing a file of F bits to N peers using a P2P architecture. Assume a fluid model. For simplicity assume that dmin is very large, so that peer download bandwidth is never a bottleneck. a. Suppose that us ≤ (us + u1 + ... + uN)/N. Specify a distribution scheme that has a distribution time of F/us . b. Suppose that us ≥ (us + u1 + ... + uN)/N. Specify a distribution scheme that has a distribution time of NF/(us + u1 + ... + uN). c. Conclude that the minimum distribution time is in general given by max{F/us , NF/(us + u1 + ... + uN)}. | CO3 | Analyse |
| 23. | Consider an overlay network with N active peers, with each pair of peers having an active TCP connection. Additionally, suppose that the TCP connections pass through a total of M routers. How many nodes and edges are there in the corresponding overlay network | CO3 | Analyse |
| 24. | Suppose Bob joins a BitTorrent torrent, but he does not want to upload any data to any other peers (so called free-riding). a. Bob claims that he can receive a complete copy of the file that is shared by the swarm. Is Bob’s claim possible? Why or why not? b. Bob further claims that he can further make his “free-riding” more efficient by using a collection of multiple computers (with distinct IP addresses) in the computer lab in his department. How can he do that? | CO3 | Analyse |
| 25. | Install and compile the Python programs TCPClient and UDPClient on one host and TCPServer and UDPServer on another host. a. Suppose you run TCPClient before you run TCPServer. What happens? Why? b. Suppose you run UDPClient before you run UDPServer. What happens? Why? c. What happens if you use different port numbers for the client and server sides? | CO3 | Analyse |
| 26. | Suppose that in UDPClient.py, after we create the socket, we add the line: clientSocket.bind(('', 5432)) Will it become necessary to change UDPServer.py? What are the port numbers for the sockets in UDPClient and UDPServer? What were they before making this change? | CO3 | Analyse |
| 27. | We have seen that Internet TCP sockets treat the data being sent as a byte stream but UDP sockets recognize message boundaries. What are one d1k, p2 = a n-1 j=0 kj - pj 2j advantage and one disadvantage of byte-oriented API versus having the API explicitly recognize and preserve application-defined message boundaries? | CO3 | Analyse |
| 28. | What is the Apache Web server? How much does it cost? What functionality does it currently have? You may want to look at Wikipedia to answer this question. | CO3 | Analyse |
| 29. | Many BitTorrent clients use DHTs to create a distributed tracker. For these DHTs, what is the “key” and what is the “value”? | CO3 | Analyse |
| 30. | Suppose Client A initiates a Telnet session with Server S. At about the same time, Client B also initiates a Telnet session with Server S. Provide possible source and destination port numbers for a. The segments sent from A to S. b. The segments sent from B to S. c. The segments sent from S to A. d. The segments sent from S to B. e. If A and B are different hosts, is it possible that the source port number in the segments from A to S is the same as that from B to S? f. How about if they are the same host? | CO3 | Analyse |
| 31. | UDP and TCP use 1s complement for their checksums. Suppose you have the following three 8-bit bytes: 01010011, 01100110, 01110100. What is the 1s complement of the sum of these 8-bit bytes? (Note that although UDP and TCP use 16-bit words in computing the checksum, for this problem you are being asked to consider 8-bit sums.) Show all work. Why is it that UDP takes the 1s complement of the sum; that is, why not just use the sum? With the 1s complement scheme, how does the receiver detect errors? Is it possible that a 1-bit error will go undetected? How about a 2-bit error | CO3 | Analyse |
| 32. | a. Suppose you have the following 2 bytes: 01011100 and 01100101. What is the 1s complement of the sum of these 2 bytes? b. Suppose you have the following 2 bytes: 11011010 and 01100101. What is the 1s complement of the sum of these 2 bytes? c. For the bytes in part (a), give an example where one bit is flipped in each of the 2 bytes and yet the 1s complement doesn’t change | CO3 | Analyse |
| 33. | Suppose that the UDP receiver computes the Internet checksum for the received UDP segment and finds that it matches the value carried in the checksum field. Can the receiver be absolutely certain that no bit errors have occurred? Explain. | CO3 | Analyse |
| 34. | onsider a reliable data transfer protocol that uses only negative acknowledgments. Suppose the sender sends data only infrequently. Would a NAK-only protocol be preferable to a protocol that uses ACKs? Why? Now suppose the sender has a lot of data to send and the end-to-end connection experiences few losses. In this second case, would a NAK-only protocol be preferable to a protocol that uses ACKs? Why? | CO3 | Analyse |
| 35. | Consider two network entities, A and B, which are connected by a perfect bidirectional channel (i.e., any message sent will be received correctly; the channel will not corrupt, lose, or re-order packets). A and B are to deliver data messages to each other in an alternating manner: First, A must deliver a message to B, then B must deliver a message to A, then A must deliver a message to B and so on. If an entity is in a state where it should not attempt to deliver a message to the other side, and there is an event like rdt\_send(data) call from above that attempts to pass data down for transmission to the other side, this call from above can simply be ignored with a call to rdt\_unable\_to\_send(data), which informs the higher layer that it is currently not able to send data. [Note: This simplifying assumption is made so you don’t have to worry about buffering data.] Draw a FSM specification for this protocol (one FSM for A, and one FSM for B!). Note that you do not have to worry about a reliability mechanism here; the main point of this question is to create a FSM specification that reflects the synchronized behavior of the two entities. You should use the following events and actions that have the same meaning as protocol rdt1.0 in Figure 3.9: rdt\_send(data), packet = make\_pkt(data), udt\_send(packet), rdt\_rcv(packet), extract (packet,data), deliver\_data(data). Make sure your protocol reflects the strict alternation of sending between A and B. Also, make sure to indicate the initial states for A and B in your FSM descriptions | CO3 | Analyse |
| 36. | Consider a scenario in which Host A wants to simultaneously send packets to Hosts B and C. A is connected to B and C via a broadcast channel—a packet 292 sent by A is carried by the channel to both B and C. Suppose that the broadcast channel connecting A, B, and C can independently lose and corrupt packets (and so, for example, a packet sent from A might be correctly received by B, but not by C). Design a stop-and-wait-like error-control protocol for reliably transferring packets from A to B and C, such that A will not get new data from the upper layer until it knows that both B and C have correctly received the current packet. Give FSM descriptions of A and C. (Hint: The FSM for B should be essentially the same as for C.) Also, give a description of the packet format(s) used. | CO3 | Analyse |
| 37. | Consider a scenario in which Host A and Host B want to send messages to Host C. Hosts A and C are connected by a channel that can lose and corrupt (but not reorder) messages. Hosts B and C are connected by another channel (independent of the channel connecting A and C) with the same properties. The transport layer at Host C should alternate in delivering messages from A and B to the layer above (that is, it should first deliver the data from a packet from A, then the data from a packet from B, and so on). Design a stop-and-wait-like error-control protocol for reliably transferring packets from A and B to C, with alternating delivery at C as described above. Give FSM descriptions of A and C. (Hint: The FSM for B should be essentially the same as for A.) Also, give a description of the packet format(s) used. | CO3 | Analyse |
| 38. | Suppose we have two network entities, A and B. B has a supply of data messages that will be sent to A according to the following conventions. When A gets a request from the layer above to get the next data (D) message from B, A must send a request (R) message to B on the A-to-B channel. Only when B receives an R message can it send a data (D) message back to A on the B-toA channel. A should deliver exactly one copy of each D message to the layer above. R messages can be lost (but not corrupted) in the A-to-B channel; D messages, once sent, are always delivered correctly. The delay along both channels is unknown and variable. Design (give an FSM description of) a protocol that incorporates the appropriate mechanisms to compensate for the loss-prone A-to-B channel and implements message passing to the layer above at entity A, as discussed above. Use only those mechanisms that are absolutely necessary | CO3 | Analyse |
| 39. | We have said that an application may choose UDP for a transport protocol because UDP offers finer application control (than TCP) of what data is sent in a segment and when. a. Why does an application have more control of what data is sent in a segment? b. Why does an application have more control on when the segment is sent? | CO3 | Analyse |
| 40. | Consider transferring an enormous file of L bytes from Host A to Host B. Assume an MSS of 536 bytes. a. What is the maximum value of L such that TCP sequence numbers are not exhausted? Recall that the TCP sequence number field has 4 bytes. b. For the L you obtain in (a), find how long it takes to transmit the file. Assume that a total of 66 bytes of transport, network, and data-link header are added to each segment before the resulting packet is sent out over a 155 Mbps link. Ignore flow control and congestion control so A can pump out the segments back to back and continuously | CO3 | Analyse |
| 41. | Host A and B are communicating over a TCP connection, and Host B has already received from A all bytes up through byte 126. Suppose Host A then sends two segments to Host B back-to-back. The first and second segments contain 80 and 40 bytes of data, respectively. In the first segment, the sequence number is 127, the source port number is 302, and the destination port number is 80. Host B sends an acknowledgment whenever it receives a segment from Host A. a. In the second segment sent from Host A to B, what are the sequence number, source port number, and destination port number? b. If the first segment arrives before the second segment, in the acknowledgment of the first arriving segment, what is the acknowledgment number, the source port number, and the destination port number? c. If the second segment arrives before the first segment, in the acknowledgment of the first arriving segment, what is the acknowledgment number? d. Suppose the two segments sent by A arrive in order at B. The first acknowledgment is lost and the second acknowledgment arrives after the first timeout interval. Draw a timing diagram, showing these segments and all other segments and acknowledgments sent. (Assume there is no additional packet loss.) For each segment in your figure, provide the sequence number and the number of bytes of data; for each acknowledgment that you add, provide the acknowledgment number. | CO3 | Analyse |
| 42. | Host A and B are directly connected with a 100 Mbps link. There is one TCP connection between the two hosts, and Host A is sending to Host B an enormous file over this connection. Host A can send its application data into its TCP socket at a rate as high as 120 Mbps but Host B can read out of its TCP receive buffer at a maximum rate of 50 Mbps. Describe the effect of TCP flow control. | CO3 | Analyse |
| 43. | Suppose that the five measured SampleRTT values (see Section 3.5.3) are 106 ms, 120 ms, 140 ms, 90 ms, and 115 ms. Compute the EstimatedRTT after each of these SampleRTT values is obtained, using a value of α = 0.125 and assuming that the value of EstimatedRTT was 100 ms just before the first of these five samples were obtained. Compute also the DevRTT after each sample is obtained, assuming a value of β = 0.25 and assuming the value of DevRTT was 5 ms just before the first of these five samples was obtained. Last, compute the TCP TimeoutInterval after each of these samples is obtained | CO3 | Analyse |
| 44. | Compare GBN, SR, and TCP (no delayed ACK). Assume that the timeout values for all three protocols are sufficiently long such that 5 consecutive data segments and their corresponding ACKs can be received (if not lost in the channel) by the receiving host (Host B) and the sending host (Host A) respectively. Suppose Host A sends 5 data segments to Host B, and the 2nd segment (sent from A) is lost. In the end, all 5 data segments have been correctly received by Host B. a. How many segments has Host A sent in total and how many ACKs has Host B sent in total? What are their sequence numbers? Answer this question for all three protocols. b. If the timeout values for all three protocol are much longer than 5 RTT, then which protocol successfully delivers all five data segments in shortest time interval? | CO3 | Analyse |
| 45. | Host A is sending an enormous file to Host B over a TCP connection. Over this connection there is never any packet loss and the timers never expire. Denote the transmission rate of the link connecting Host A to the Internet by R bps. Suppose that the process in Host A is capable of sending data into its TCP socket at a rate S bps, where S = 10 · R. Further suppose that the TCP receive buffer is large enough to hold the entire file, and the send buffer can hold only one percent of the file. What would prevent the process in Host A from continuously passing data to its TCP socket at rate S bps? TCP flow control? TCP congestion control? Or something else? Elaborate. | CO3 | Analyse |
| 46. | Consider sending a large file from a host to another over a TCP connection that has no loss. a. Suppose TCP uses AIMD for its congestion control without slow start. Assuming cwnd increases by 1 MSS every time a batch of ACKs is received and assuming approximately constant round-trip times, how long does it take for cwnd increase from 6 MSS to 12 MSS (assuming no loss events)? b. What is the average throughout (in terms of MSS and RTT) for this connection up through time = 6 RTT? | CO3 | Analyse |
| 47. | Consider that only a single TCP (Reno) connection uses one 10Mbps link which does not buffer any data. Suppose that this link is the only congested link between the sending and receiving hosts. Assume that the TCP sender has a huge file to send to the receiver, and the receiver’s receive buffer is much larger than the congestion window. We also make the following assumptions: each TCP segment size is 1,500 bytes; the two-way propagation delay of this connection is 150 msec; and this TCP connection is always in congestion avoidance phase, that is, ignore slow start. a. What is the maximum window size (in segments) that this TCP connection can achieve? b. What is the average window size (in segments) and average throughput (in bps) of this TCP connection? c. How long would it take for this TCP connection to reach its maximum window again after recovering from a packet loss? | CO3 | Analyse |
| 48. | Consider the scenario described in the previous problem. Suppose that the 10Mbps link can buffer a finite number of segments. Argue that in order for the link to always be busy sending data, we would like to choose a buffer size that is at least the product of the link speed C and the two-way propagation delay between the sender and the receiver. | CO3 | Analyse |
| 49. | Consider a simplified TCP’s AIMD algorithm where the congestion window size is measured in number of segments, not in bytes. In additive increase, the congestion window size increases by one segment in each RTT. In multiplicative decrease, the congestion window size decreases by half (if the result is not an integer, round down to the nearest integer). Suppose that two TCP connections, C1 and C2, share a single congested link of speed 30 segments per second. Assume that both C1 and C2 are in the congestion avoidance 1.22 MSS RTT 2L PROBLEMS 299 phase. Connection C1’s RTT is 50 msec and connection C2’s RTT is 100 msec. Assume that when the data rate in the link exceeds the link’s speed, all TCP connections experience data segment loss. a. If both C1 and C2 at time t0 have a congestion window of 10 segments, what are their congestion window sizes after 1000 msec? b. In the long run, will these two connections get the same share of the bandwidth of the congested link? Explain | CO3 | Analyse |

Solve the problems as per the following:

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| Regd  No | Question No | Regd No | Question No | Regd No | Question No | Regd No | Question No | Regd No | Question No |
| 266 | 1,49 | 280 | 15,35 | 294 | 5,46 | 2A9 | 19,32 | 2C3 | 9,43 |
| 267 | 2,48 | 281 | 16,34 | 295 | 6,45 | 2B0 | 20,31 | 2C4 | 10,42 |
| 268 | 3,47 | 282 | 17,33 | 296 | 7,44 | 2B1 | 21,30 | 2C5 | 11,41 |
| 269 | 4,46 | 283 | 18,32 | 297 | 8,43 | 2B2 | 22,29 | 2C6 | 12,40 |
| 270 | 5,45 | 284 | 19,31 | 298 | 9,42 | 2B3 | 23,28 | 2C7 | 13,39 |
| 271 | 6,44 | 285 | 20,30 | 299 | 10,41 | 2B4 | 24,27 | 2C8 | 14,38 |
| 272 | 7,43 | 286 | 21,29 | 2A0 | 11,40 | 2B5 | 1,26 | Le-7 | 15,37 |
| 273 | 8,42 | 287 | 22,28 | 2A1 | 12,39 | 2B6 | 2,25 | Le-8 | 16,36 |
| 274 | 9,41 | 288 | 23,27 | 2A2 | 13,38 | 2B7 | 3,49 | Le-9 | 17,35 |
| 275 | 10,40 | 289 | 24,26 | 2A3 | 14,37 | 2B8 | 4,48 | Le-10 | 18,34 |
| 276 | 11,39 | 290 | 1,25 | 2A4 | 15,36 | 2B9 | 5,47 | Le-11 | 19,33 |
| 277 | 12,38 | 291 | 2,49 | 2A5 | 16,35 | 2C0 | 6,46 | Le-12 | 20,32 |
| 278 | 13,37 | 292 | 3,48 | 2A6 | 17,34 | 2C1 | 7,45 |  |  |
| 279 | 14,36 | 293 | 4,47 | 2A8 | 18,33 | 2C2 | 8,44 |  |  |