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Third Year Computer Networks Question Paper

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SECTION 1: MULTIPLE CHOICE QUESTION (10 Questions, 1 Marks each)

Bloom's Taxonomy Level: 3

Topic: Application Layer

Subtopic: Basics of Socket Programming

Q1: **Which of the following is NOT a fundamental element of a socket in socket programming?**

(a) IP address of the server

(b) Port number of the client

(c) Protocol type (e.g., TCP or UDP)

(d) Operating System kernel version (1 Marks)

Q2: **A client initiates a connection to a server using a specific port number. What happens if another client attempts to connect to the server using the *same* port number simultaneously?**

(a) Both clients will successfully connect.

(b) The second client will connect, replacing the first.

(c) The second client's connection attempt will likely fail.

(d) The server will automatically assign a different port to the second client. (1 Marks)

Q3: **In a client-server model using TCP sockets, which socket function is typically used by the client to establish a connection to the server?**

(a) `recv()`

(b) `send()`

(c) `bind()`

(d) `connect()` (1 Marks)

Subtopic: BitTorrent Protocol

Q4: **Question 1 (1 mark):** (1 Marks)

Q5: In the BitTorrent protocol, what is the primary role of a peer that possesses a

complete copy of the file being shared? (1 Marks)

Topic: Network Layer, Routers, IPv4, IPv6

Subtopic: Causes

Q6: **Question 1 (1 mark):** (1 Marks)

Q7: Which of the following is NOT a primary cause of network congestion at the network layer, impacting both IPv4 and IPv6 routing? (1 Marks)

Subtopic: Datagram Format

Q8: **Question 1 (1 mark):** (1 Marks)

Q9: In an IPv4 datagram, which field identifies the next header in a fragmented packet or in a packet with options? (1 Marks)

Subtopic: Fragmentation

Q10: Which of the following statements is TRUE regarding IP fragmentation? (1 Marks)

SECTION 2: DESCRIPTIVE (10 Questions, 1 Marks each)

Bloom's Taxonomy Level: 2

Topic: Application Layer

Subtopic: Basics of Socket Programming

Q11: Describe the fundamental difference between a client socket and a server socket in the context of socket programming. (1 Marks)

Q12: Explain the purpose of the `bind()` system call in socket programming and what happens if it fails. (1 Marks)

Q13: Describe the role of the `listen()` system call in a server-side socket program. What parameter controls the number of pending connections? (1 Marks)

Q14: Briefly explain the difference between the `SOCK_STREAM` and `SOCK_DGRAM` socket types and provide a real-world example application for each. (1 Marks)

Q15: What is the significance of the port number in socket programming? Describe its role in establishing a connection between a client and a server. (1 Marks)

Subtopic: BitTorrent Protocol

Q16: Briefly describe the role of trackers in the BitTorrent protocol. (1 Marks)

Q17: Explain the concept of "piece" in the context of BitTorrent file sharing. (1 Marks)

Q18: What is the purpose of the "choking" and "unchoking" mechanisms in BitTorrent? Explain briefly. (1 Marks)

Q19: How does BitTorrent utilize a distributed hash table (DHT) to locate peers sharing a specific torrent file? (1 Marks)

Q20: Describe the difference between a "leech" and a "seed" in the BitTorrent peer-to-peer network. (1 Marks)