First Name:
Last Name:
Student Number:

This is a quick quiz and is used as a measure of your involved presence in the classroom. You have 35 minutes for the following 25 questions. Please mark your answer, using a pencil, in the provided bubble sheets. Please do not forget to write your name on this page and on the bubble sheets.

For multiple choice questions, please choose the best option and fully fill the corresponding bubble on bubble sheet. For true or false questions, use the first two bubbles in the bubble sheet respectively.

Please return the questions with your answer sheet.

True or False Questions

1) Network control plane functionalities are essentially centralized, and there is no distributed way to provide control plane functionality.
   (a) True     (b) False

2) Internet is a constant bit rate service provided at the network and transport layers.
   (a) True     (b) False

3) Logically centralized control means that a logically central routing controller computes and distributes the forwarding tables to be used by each and every router, and each router does not compute its forwarding table.
   (a) True     (b) False

4) The information exchanged among the routers is different between Link State and Distance Vector algorithms and protocols.
   (a) True     (b) False

5) Head of line queueing is an output queueing phenomenon and the reason that input queueing is generally preferred.
   (a) True     (b) False

6) A subnet does not contain a router; its boundaries are defined by the router and host interfaces.
   (a) True     (b) False

7) Routing algorithms determine values in each router’s forwarding table in a decentralized (per-router) way.
   (a) True     (b) False

8) Routing takes place in a very short time and is usually implemented in hardware. Forwarding could take a longer time compared to routing and usually happens in software.
   (a) True     (b) False

9) Routing is based on MAC address and forwarding is based on IP address.
10) Count to infinity is a problem that happens in distance vector routing with link cost changes, due to not having a complete knowledge of network.
   (a) True (b) False

11) DHCP is used to find out and assign IP addresses to core and edge routers.
    (a) True (b) False

12) In TCP congestion control, while in congestion avoidance state, timeout can change the state to slow start and duplicate ACKs can change the state to fast recovery.
    (a) True (b) False

13) DHCP is a network layer protocol, and the upper layer protocol for it is TCP.
    (a) True (b) False

14) Match destination MAC address and action of forward or flood is a possible firewall match and action combination.
    (a) True (b) False

15) Using tunneling, IPv6 datagram can be carried as payload in IPv4 datagram among IPv4 routers.
    (a) True (b) False

**Multiple Choice Questions**

16) Which statements is correct about checksum?
   (a) Checksum is a method used for error correction
   (b) IPv4 packets use a checksum
   (c) TCP packets do and UDP packets do not have a checksum
   (d) Checksum is essential in the network layer functionality

17) Switching using which method is capable of forwarding multiple packets in parallel?
   (a) Memory
   (b) Bus
   (c) Crossbar
   (d) Switch fabric

18) Let $d_x(y)$ be the cost of the least-cost path from node x to node y and $c(x,y)$ denote the cost of the link between nodes x and y, then $d_x(y) = \min_v \{c(x,v) + d_v(y)\}$ denotes:
   (a) Link State Algorithm to find the least cost path
   (b) Breadth First Search Algorithm to find the least cost path
   (c) Depth First Search Algorithm to find the least cost path
   (d) Distance Vector Algorithm to find the least cost path

19) Which statement is correct about network address translation (NAT)?
   (a) Drop, redirect, and remember are the main functionalities that happen at NAT for outgoing packet
   (b) Using NAT allows changing of the addresses of devices in local network without notifying the outside world
   (c) All devices behind a NAT are still visible to the whole external network
   (d) TCP ports are used and preserved in P2P communication while using a NAT

20) Which of the following addresses is a valid IP address within the given subnet?
(a) IP: 171.64.0.14, Router: 171.64.2.1/24
(b) IP: 10.1.3.255, Router: 10.1.3.1/24
(c) IP: 10.92.33.44, Router: 10.92.33.1/32
(d) IP: 10.1.3.128, Router: 10.1.3.1/24

21) Which statement is correct about route aggregation?
   (a) An aggregated route has a longer prefix that each of the networks represented
   (b) Route aggregation uses a single prefix to advertise multiple networks
   (c) Route aggregation is used to advertise the routes to local networks
   (d) Route aggregation is centralized control functionality

22) Which statement is correct about forwarding table?
   (a) Each entry in the forwarding table of a destination-based forwarding contains only a match value and the outgoing link interface to which a packet is to be forwarded
   (b) The longer prefix matching tries to match with the most general route matching the destination of a packet
   (c) Forwarding table is required for functionality of the data plane, and is implemented in each router
   (d) a and c are both correct

23) Which statement is correct about routing algorithms?
   (a) Bellman Ford algorithm is used by link state protocols
   (b) Dijkstra algorithm is used by distance vector protocols
   (c) Bellman ford algorithm is used by distance vector protocols
   (d) a and b are both correct

24) Which statement is correct?
   (a) IPv6 supports fragmentation and reassembly
   (b) IPv4 supports 128-bit addressing
   (c) A major Internet Protocol functionality is addressing capability
   (d) IPv4 includes checksum and acknowledgement fields

25) The Internet Protocol (IPv4) is an example of a
   (a) connection-less network layer protocol
   (b) connection-oriented network layer protocol
   (c) connection-less transport layer protocol
   (d) connection-oriented transport layer protocol