BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – B.Sc.(ANCS)-Hons-2021/B.Sc.(ANCS)-Hons-2022
Course Name – Switching and Routing
Course Code - BNCSC301
(Semester III)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) The Data Link Layer protocols are recognized for:
   a) Logical addressing and routing
   b) Flow control and error detection
   c) Data compression and decompression
   d) Providing end-user services

(ii) Which layer of the OSI model deals with data compression and decompression?
   a) Presentation Layer
   b) Transport Layer
   c) Session Layer
   d) Data Link Layer

(iii) Which layer of the OSI model is responsible for creating and managing sessions between applications on different devices?
   a) Session Layer
   b) Data Link Layer
   c) Network Layer
   d) Presentation Layer

(iv) Which device is used to connect multiple Ethernet devices and reduce collisions in a network?
   a) Repeater
   b) Switch
   c) Hub
   d) Router

(v) The main purpose of the "Neighbor Discovery Protocol" in IPv6?
   a) To improve network security
   b) To provide Layer 3 routing
   c) To manage Layer 2 addresses
   d) To replace IPv4 addresses

(vi) Define the primary historical reason for the development of IPv6.
   a) To improve network performance
   b) To support more available IP addresses
   c) To enhance security features
   d) To reduce network congestion

(vii) The role of a "Designated Router (DR)" in IPv6's OSPF?
   a) To reduce packet headers
   b) To simplify hexadecimal notation
   c) To share routing information
   d) To eliminate manual configuration

(viii) In IPv6, an address is represented in how many groups of hexadecimal digits?
   a) 4
   b) 6
   c) 8
   d) 16

(ix) Identify, which of the following is a loopback address in IPv6.

a) ::1 b) ::ffff:192.168.1.1
c) 2001::1 d) ::192.168.1.1

(x) An IPv6 address of the form "FF02::2" represents what type of address it is.

a) Link-Local Address b) Unique Local Address
c) Global Unicast Address d) All Routers Multicast Address

(xi) Identify the mode where users allows to make changes to the router's configuration but not view passwords.

a) User EXEC Mode b) Privileged EXEC Mode
c) Global Configuration Mode d) Setup Mode

(xii) What does the "show version" command display on a Cisco router?

a) The router's configuration file b) The current operating system version
c) The router's IP address d) The router's serial number

(xiii) Select the correct command to change the hostname in a Cisco router.

a) hostname [new hostname] b) host [new hostname]
c) change hostname [new hostname] d) set hostname [new hostname]

(xiv) Identify the default hostname for a Cisco router.

a) Router b) cisco
c) config d) hostname

(xv) What is the primary purpose of VTP advertisements in terms of communication?

a) Advertisements promote VLANs b) Advertisements announce VLAN changes
c) Advertisements secure VLANs d) Advertisements create VLANs

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Explain the seven layers of the OSI Reference Model in detail, highlighting the specific functions and protocols associated with each layer. (3)
3. Explain the concept of routing loops in dynamic routing and the mechanisms used to prevent or mitigate them, such as Maximum Hop Count, Split Horizon, and Route Poisoning. (3)
4. Define the "Basic Service Set (BSS)" in wireless LAN topologies and explain its role in wireless network communication. (3)
5. Describe the role of a "Mesh Network" in wireless topologies and how it provides redundancy and resilience in wireless communication. (3)
6. Provide an overview of RF (Radio Frequency) in the context of wireless communication, including how RF signals propagate and their susceptibility to interference. (3)

OR

Explain the concept of "Access Points (APs)" in wireless networks and their role in connecting wireless devices to wired networks. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Provide an introduction to IPv6, explaining the historical reasons for its development and the need for a new IP version to address the limitations of IPv4, such as address exhaustion. (5)
8. Provide an introduction to EIGRP (Enhanced Interior Gateway Routing Protocol) and explain its primary features and operation in routing. (5)
9. Describe the different types of EIGRP packets, including Hello, Update, Acknowledgment, Query, and Reply packets. (5)
10. Explain the various types of OSPF packets, including Hello, DD (Database Description), LS (Link State), and LS Acknowledgment packets. (5)

11. Describe the concept of the Native VLAN, including its role in Trunk Links and the purpose of having a designated Native VLAN. (5)

12. Describe the different types of OSPF tables, including the Neighbor Table, Topology Table, Routing Table, and LSDB (Link State Database). (5)

OR

Explain the Address Learning, Forward/Filter Decision, and Loop Avoidance functions of switches at Layer 2, highlighting their importance in network operation. (5)

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