



Dezyne École College

Bachelor of Computer Application (B.C.A.) Second Year-2nd Semester

Computer Networks

Part-A: 20 Short Answer Questions (2 Marks Each)

(Answer in 50 words)

1. Define a computer network.
2. Differentiate between public and private networks.
3. What is the role of a router in networking?
4. List two differences between switch and hub.
5. What is the purpose of the OSI model?
6. Name all seven layers of the OSI reference model.
7. What is an IPv4 address? Give an example.
8. Define subnetting with a simple example.
9. What is the default subnet mask for Class B?
10. Mention one key benefit of IPv6 over IPv4.
11. What is static routing?
12. What is the difference between RIP and OSPF?
13. Define NAT and PAT.
14. What is a leased line in WAN technology?
15. Expand HDLC and PPP.
16. What is CHAP in authentication protocols?
17. Define VLAN.
18. What is the purpose of the VTP domain?
19. What is NS2 used for?
20. What are trace files in NS2?

Part-B: 40 Long Answer Questions (10 Marks Each)

(Answer in ~400 words)

Unit I: Network Models, IP Addressing, Subnetting, IPv6, and Router Configuration

1. Explain Ethernet and token ring with diagrams.
2. Compare bridge, router, switch, and gateway with functions and examples.
3. Describe the OSI 7-layer reference model in detail.
4. What are public and private IP addresses? Give ranges for Class A, B, and C.
5. Perform Class C subnetting for a network with 4 subnets. Show calculations.
6. Perform subnetting for Class A address with a requirement of 500 subnets.
7. What is IPv6? Explain its address types and header structure.
8. Compare IPv4 and IPv6 with key differences.
9. Explain the translation techniques between IPv4 and IPv6.
10. Discuss basic router configuration using CLI commands (enable, configure, etc.).

Unit II: IP Routing, Access Lists, WAN, VPN, and Switching

11. What is static routing? Explain with configuration commands.
12. Describe RIP and OSPF dynamic routing protocols with advantages.
13. Compare standard and extended access control lists (ACLs) with examples.
14. Define NAT. Explain static NAT, dynamic NAT, and PAT with diagrams.
15. Troubleshoot a NAT configuration issue and explain common errors.
16. Explain WAN technologies: Leased Line vs. PPP vs. HDLC.
17. What is PPP protocol? Explain its layers and authentication methods (PAP/CHAP).
18. Explain the concept and benefits of VPN. How is it configured?
19. What is Frame Relay? Describe virtual circuits, inverse ARP, and configuration steps.
20. What is Spanning Tree Protocol (STP)? How does it prevent loops?
21. Differentiate between switch and hub in terms of duplex modes and collision domains.
22. Write configuration steps for VLAN and VTP with examples.
23. Explain the internal operations of a switch and its role in forwarding frames.
24. What is MAC address configuration? How is it handled on a switch?

Unit III: NS2 Simulator and Wired Network Simulations

25. What is NS2? Explain its purpose and architecture.
26. How is NS2 installed and used? List software dependencies and procedure.

27. Compare OTcl and C++ interfaces in NS2.
28. Explain the format and purpose of trace files in NS2 simulations.
29. Describe the basic syntax used in NS2 with examples of node creation.
30. Write an NS2 script to simulate a 2-node communication using TCP.
31. How do you send traffic through NS2 links? Show with traffic generation examples.
32. Explain the configuration of link parameters such as delay, bandwidth, and queue.
33. What are routing protocols supported in NS2? Explain with examples.
34. Describe a scenario of a wired network using NS2 with traffic and link configurations.
35. What are simulation objects in NS2? Explain the flow from script to result.
36. Describe the Finish procedure and how NS2 terminates a simulation.
37. How is a simulation run in NS2 and visualized in NAM?
38. How are agents created and used in NS2 communication?
39. What is the role of timers and event handlers in NS2?
40. Explain how to invoke external commands from within an NS2 simulation script.



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B.C.A. (Part-II) (Semester-III)
Examination 2024
(Held in 2025)
DCC - BCA - 302
(Computer Networks)

Duration of Examination: 3 Hours

परीक्षा की अवधि: 3 घण्टा

Max. Marks: 70

पूर्णांक: 70

Instructions to the Candidates:

परीक्षार्थी के लिए निर्देश:-

Note:- The question paper is divided into 02 Parts: Part - A & Part-B.

Part-A

Will consist of 10 compulsory questions. Answer to each question shall be limited up to 50 words. Each question will carry 02 marks. Total 20 Marks.

(Marks-10×2=20)

Part-B

Will consist of 10 questions. Student will have to answer 05 questions, selecting At least one questions from each unit. The answer to each question shall be limited upto 400 words. Each question carries 10 marks. Total 50 Marks.

(Marks-5×10=50)

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Part-A

- 1- Define private and public networks.
- 2- Define multicast with example.
- 3- Describe class B subnetting.
- 4- Define NAT with example.
- 5- Define P to P communication.
- 6- Define packet switch network.
- 7- Define OTel interface.
- 8- What do you mean by NAM and Finish procedure.
- 9- Define enabling frame relay.
- 10- Define static routing.



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Part-B

Unit-I

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- 11- Explain OSI reference model with suitable example and discuss each and every phrase of layer.
- 12- Explain IP addressing in network concept and discuss the class A/B/C/D with suitable example.
- 13- Describe the IPV6 with host address assignment and define the IPV6 routing protocol.

Unit-II

- 14- Define the subnet mask with suitable example and explain the subnetting & problem of class A and class B.
- 15- Explain dynamic routing with EIGRP and OSPF with suitable example.
- 16- Explain PPP layers & its explanation with suitable example.
- 17- Explain the mode of operation of switch and describe the half duplex and full duplex with example.

Unit-III

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- 18- Explain configuring the MAC address and describe the VLAN configuration.
- 19- Explain the trace file in NS-2 and describe the support protocol for NS-2.
- 20- Explain the concept of sending packet with traffic management through NS2 links.

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BCA (Part-III) Examination, 2024
Paper - BCA - 303
Computer Networks

Duration of Examination: 3 Hours

Max. Marks: 50

परीक्षा की अवधि: 3 घण्टा

पूर्णांक: 50

Instructions to the Candidates:परीक्षार्थी के लिए निर्देश:-**Part-A (Compulsory)**

Answer all ten questions (upto 20 words each). Each question carries equal marks.

(Marks-15)

Part-B (Compulsory)

Answer all five questions (upto 50 words each). Each question carries equal marks.

(Marks-15)

Part-C

Answer any three questions (upto 400 words each). Selecting one question from each unit.

Three questions of 7, 7 & 6 marks.

(Marks-20)

Part-A

1- Distinguish Baseband and Broadband.

2- What is Baud rate? *

3- Give example of Infrared transmission.

4- Write the use of SLIP Protocol. *

5- What are the services provided by a data link layer?

6- Define Full Duplex mode.

7- Explain the concept of Half Duplex Communication.

8- Differentiate multicast and any cast.

9- Discuss Wireless LANs advantages over traditional wired networks.

10- What is Congestion? How congestion occur?

Part-B

11- Differentiate between circuit- switched and packet switched networks. Discuss the role of switches and hubs in network components.

12- Discuss how radio frequency signals are utilized in wireless networks and their role in connecting devices.

13- Name and explain two security measures essential for wireless networks. Discuss their importance in safeguarding data transmission in mobile computing environments. *



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14-

Describe Ethernet briefly. Name one common type of Ethernet cable and its primary use in networking.

15-

Differentiate between a hub and a switch in networking. Explain one advantage of using a switch over a hub.

Part-C

Unit-I

16-

Discuss the significance of the OSI model in the field of networking. Explain how the layered approach aids in Understanding and designing complex network systems. Provide examples to illustrate the role of each layer.

OR

Explain the different network topologies, such as bus, star, and mesh. Discuss the advantages and disadvantages of each. Classify networks based on their size [LAN, MAN, WAN] and provide real world examples for each category.

Unit-II

17-

Explain the IPv4 addressing scheme and the concept of sub netting. Provide a step by step guide on how to subnet an IPv4 address and discuss its significance in network design.

OR

Conduct a comprehensive comparative analysis of frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA) and Code Division Multiple Access (CDMA) in terms of efficiency, scalability, and application in personal communication systems.

Unit-III

18-

Provide an overview of Wireless LANs and the IEEE 802.11 standard. Discuss the key features and protocols within the IEEE 802.11 standard that enable wireless connectivity.

OR

Explain the basics of Bluetooth technology. Discuss the range, applications, and advantages of using Bluetooth for wireless communication between devices.

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