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Computer Networks Important Questions PDF

The most important Computer Networks questions are the OSI and TCP/IP models, transmission media and switching, CRC and Hamming code numericals, sliding window protocols (Go-Back-N and Selective Repeat), CSMA/CD, IPv4 addressing and subnetting, distance vector and link state routing, TCP versus UDP, the three-way handshake, congestion control, and DNS, HTTP and email protocols.

Key takeaways

- Subnetting, CRC and sliding window numericals are the most common long questions.
- Draw the OSI and TCP/IP models side by side with the protocols at each layer.
- Learn the TCP header and the three-way handshake diagram well.
- These are practice questions, not past papers; check your own syllabus and official previous papers.

About these important questions

This page lists the most important Computer Networks questions for B.Tech CSE and IT exams, arranged unit by unit. The units follow the standard syllabus that most Indian technical universities share, so the order may differ slightly from yours.

Please note: these are practice questions based on common syllabus topics. They are not verified past papers, and we do not claim that any question will appear in your exam. Check your own university syllabus first, then solve the official previous year papers. AKTU students can download them from the AKTU old question paper archive.

Unit 1: Introduction and Physical Layer

Covers network types, topologies, reference models, media and switching.

Short questions (2 marks)

- Differentiate between LAN, MAN and WAN.
- What is the difference between bandwidth and throughput?
- State the Nyquist and Shannon capacity formulas.

Long questions

1. Explain the OSI model and compare it with the TCP/IP model.
2. Explain network topologies (bus, star, ring, mesh) with advantages and drawbacks.

3. Compare guided media: twisted pair, coaxial cable and optical fibre.
4. Compare circuit switching, message switching and packet switching.
5. A channel has 3000 Hz bandwidth and SNR of 30 dB. Find its capacity. *Hint:* convert 30 dB to 1000 first, then use C = B log2(1 + SNR).

Unit 2: Data Link Layer

Covers framing, error detection and correction, flow control and medium access.

Short questions (2 marks)

- What is bit stuffing?
- Differentiate between pure and slotted ALOHA.
- What is piggybacking?

Long questions

1. Find the CRC for a given message and generator polynomial, and show how the receiver checks it.
2. Find the Hamming code for a data word and correct a single-bit error.
3. Explain stop-and-wait, Go-Back-N and Selective Repeat ARQ with diagrams, and the window size limits.
4. Explain CSMA, CSMA/CD and CSMA/CA.
5. Derive the maximum throughput of pure and slotted ALOHA (18.4% and 36.8%).

Unit 3: Network Layer

Covers IP addressing, subnetting, routing algorithms and network protocols. This unit carries the most numericals.

Short questions (2 marks)

- What is the difference between classful and classless addressing?
- What does ARP do?
- List two differences between IPv4 and IPv6.

Long questions

1. Given the block 192.168.10.0/24, create 4 (or 8) subnets and give each one's network address, broadcast address and host range.
2. Explain the IPv4 header with a diagram.
3. Explain the distance vector routing algorithm and the count-to-infinity problem.
4. Explain link state routing using Dijkstra's algorithm.
5. Explain ARP, RARP, ICMP and DHCP.
6. Explain NAT and its uses.
7. Compare IPv4 and IPv6 headers, and explain the transition methods: dual stack, tunnelling and header translation.

Unit 4: Transport Layer

Covers process-to-process delivery, UDP, TCP and congestion control.

Short questions (2 marks)

- What is a socket?
- Differentiate between TCP and UDP.
- What is a port number?

Long questions

1. Explain the TCP header format with a diagram.
2. Explain TCP connection establishment (three-way handshake) and termination.
3. Explain TCP congestion control: slow start, congestion avoidance, fast retransmit and fast recovery.
4. Explain the leaky bucket and token bucket algorithms.
5. Explain quality of service (QoS) and its techniques.
6. Explain how UDP works, its header, and why DNS and video streaming use it.

Unit 5: Application Layer

Covers DNS, the web, email, file transfer and network security basics.

Short questions (2 marks)

- What is a URL?
- Differentiate between persistent and non-persistent HTTP.
- Name the protocols used to send and receive email.

Long questions

1. Explain DNS, its hierarchy, and recursive and iterative resolution.
2. Explain HTTP request and response messages and common status codes.
3. Explain SMTP, POP3 and IMAP.
4. Explain FTP and its control and data connections.
5. Explain symmetric and public key cryptography and the RSA algorithm with a small example.
6. Explain firewalls, digital signatures and how HTTPS uses TLS to protect web traffic.

Sample answer outline: Subnetting a /24 network

A subnetting question typically says: divide 192.168.10.0/24 into 4 equal subnets. Answer like this:

1. **Find the bits to borrow.** 4 subnets need 2 bits, because 2^2 = 4. The new prefix is /26, and the mask is 255.255.255.192.
2. **Find the block size.** 256 - 192 = 64, so each subnet has 64 addresses and 62 usable hosts (64 minus the network and broadcast addresses).
3. **Make the table.** Subnet 1: network 192.168.10.0, hosts .1 to .62, broadcast .63. Subnet 2: network .64, hosts .65 to .126, broadcast .127. Continue for .128 and .192.

4. **Answer any extra part.** If asked which subnet a host such as 192.168.10.100 belongs to, divide the last octet by the block size: it falls in the .64 subnet.
5. **For unequal sizes, use VLSM.** Sort the requirements from largest to smallest and allocate the biggest block first, so no ranges overlap.

Show the binary of the last octet for one subnet. It proves you understand the method, not just the shortcut.

Marks weightage and how to write answers

A common pattern, used by AKTU and many other universities, has a compulsory short-answer section that covers every unit, followed by long-answer questions with a choice inside each unit. Marks per question change between universities and years, so confirm the scheme on a recent official paper.

- **Short answers (about 2 marks):** a crisp definition, one example or diagram, and nothing more. Three to five lines is enough.
- **Long answers (7 to 10 marks):** start with a definition, add a labelled diagram or table, explain the steps, and finish with an example, advantages or a comparison.
- For subnetting, show the borrowed bits, the new mask and a table of subnets. A table makes the answer easy to mark.
- For protocols, a labelled timing diagram (sender, receiver, frames, ACKs) earns more than text alone.

A 7-day revision plan for Computer Networks

1. **Days 1 to 5:** one unit a day. Read your notes, then write the long answers for that unit from memory and check them against your notes.
2. **Day 6:** redo one numerical each of CRC, Hamming code, sliding window, channel capacity and subnetting.
3. **Day 7:** solve one full official previous year paper in three hours, then check which units cost you time.

Keep a single sheet of formulas, definitions and diagrams for the last hour before the exam.

Frequently asked questions

Which Computer Networks topics are most important?

OSI and TCP/IP models, CRC and Hamming code, sliding window protocols, IPv4 addressing and subnetting, routing algorithms, TCP and the three-way handshake, and DNS and HTTP are asked most often.

How do I practise subnetting?

Take a block such as /24, decide how many subnets or hosts you need, borrow bits, and write the network, broadcast and host range for each subnet. Repeat with different blocks until you can do it in five minutes.

Is Computer Networks useful for jobs?

Yes. Developer, cloud, DevOps and security roles all need networking basics such as TCP/IP, DNS, HTTP and subnetting.

Are these Computer Networks questions from previous year papers?

No. They are practice questions built from topics that appear in most B.Tech Computer Networks syllabi. Use them with your own university's official previous papers, for example the AKTU archive at https://aktu.ac.in/old-question-paper.html.

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Sources and further reading

- AKTU: old question papers (official archive)
- RFC 9293: Transmission Control Protocol (TCP)
- RFC 791: Internet Protocol
- NPTEL: online courses from IITs (search for Computer Networks)

About this PDF

These are practice questions for revision, prepared by the Uncodemy trainer team from common B.Tech syllabus topics. They are not past papers, a certificate or a promise of marks. Spot an error? Write to info@uncodemy.com and the team will review it.

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