



Faculty of Computing and Technology

Department of Computer Science

Bachelor of Honors in Computer Science | Software Engineering | Information Technology

Batch 01 – Semester 02

End Examination

Year 2023

CS|SE|IT 1210 - Data Communication and Networks

Duration: Three Hours

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**Instructions to the candidates:**

1. Answer ALL the questions.
2. Illustrate your answers with clear diagrams wherever applied.
3. The paper is marked out of 100 marks.
4. Follow the general guidelines given by the department of examination.

**Question 1**

- ☒ A. Briefly describe three fundamental characteristics of communication. (06 Marks)
- ☒ B. Describe the modes of communication which are categorized based on the communication direction. (06 Marks)
- ☒ C. Discuss any three types of network topologies by drawing diagrams and discuss their advantages and disadvantages. (09 Marks)
- ☒ D. Describe what are the protocols and standards in data communication. (04 Marks)
- (Total 25 Marks)

✓ Question 2

- ✓ A. Distinguish among Local Area Network and Wide Area Network. (04 Marks)
  - ✓ B. What are the advantages of using fiber optic instead of twisted pair and coaxial cables? (06 Marks)
  - ✓ C. Describe three transmission impairments. (06 Marks)
  - ✓ D. Describe the throughput and bandwidth which are metrics used for measuring the performance of the networks. (04 Marks)
  - ✓ E. Using diagrams, distinguish between serial and parallel transmissions. (05 Marks)
- (Total 25 Marks)

Question 3

- ✓ A. Write the equation for calculating the packet transmission delay while describing the packet transmission delay. (05 Marks)
  - ✓ B. Explain the main two activities of routers, "routing" and "forwarding". (04 Marks)
  - ✓ C. Distinguish between packet switching and circuit switching. (04 Marks)
  - ✓ D. Describe the components of equation while describing what it is used for.
- $$d_{nodal} = d_{proc} + d_{queue} + d_{trans} + d_{prop}$$
- (06 Marks)
- ✓ E. The *traceroute* program lets you troubleshoot network issues. Describe how the traceroute program works. (06 Marks)
- (Total 25 Marks)

Question 4

- ✓ A. Describe the OSI reference model and the purpose of it. (08 Marks)
  - ✓ B. Describe three duties of the transport layer in OSI model. (06 Marks)
  - ✓ C. Are all the OSI layers implemented as peer-to-peer processes? Justify your answer. (04 Marks)
  - ✓ D. Briefly describe the IPV4 and IPV6 address structures. (04 Marks)
  - ✓ E. Explain the usage of subnet mask in classless interdomain routing. (03 Marks)
- (Total 25 Marks)
- subnet mask is split an IP address small parts.

\*\*\*\*\* END OF THE PAPER \*\*\*\*\*