



## **NATIONAL SCHOOL OF BUSINESS MANAGEMENT**

**BSc in Management Information Systems (Special) (NSBM)– 21.2**

**BSc (Honours) in Software Engineering (NSBM)– 21.2**

**BSc (Honours) in Computer Networks (NSBM)– 21.2**

**BSc (Honours) in Computer Science (NSBM)– 21.2**

**Bachelor of Information Technology (NBIT): major in Web and Mobile Application Development (VU)– 21.2**

**Year 01 Semester 02 Examination**

**17 August 2022**

**CN101.3- Data Communications and Network**

### **Instructions to Candidates**

- 1) **Answer all questions in Part A and answer TWO questions from Part B.**
- 2) **Time allocated for the examination is five (05) hours (Including downloading and uploading time) . (Note: No email submissions are accepted under any condition.)**
- 3) **Weightage of Examination: 60% out of final grade**
- 4) **Download the paper, provide answers to the selected questions in a word document.**
- 5) **Please upload the document with answers (Answer Script) to the submission link before the submission link expires**
- 6) **Answer script should be uploaded in PDF Format**
- 7) **Under any circumstances E-mail submissions would not be taken into consideration for marking. Incomplete attempt would be counted as a MISSED ATTEMPT.**
- 8) **The Naming convention of the answer script – Module Code\_Subject name\_Index No**
- 9) **You must adhere to the online examination guidelines when submitting the answer script to N-Learn.**
- 10) **Your answers will be subjected to Turnitin similarity check, hence, direct copying and pasting from internet sources, friend's answers etc. will be penalized.**

**Part A**  
**Answer all the questions.**

**Question 01\_ (Total 25 marks)**

Nalinda is chatting with Darshana through a web application (using a chrome browser) with a 5.5 Mbps 4G internet connection. The connection between Nalinda's computer and Darshan's is full of disturbances (errors) due to various technical reasons.

1. Identify the reasons to have many errors in the connection and explain (11 Marks)
2. Explain the above communication between Nalinda's computer and Darshana's Computer by using OSI 7 layer reference Model (11 Marks)
3. Covert 1.4 Gbps connection speed into **Mbps** and **kbps** (03 Marks)

**Question 02\_ (Total 25 marks)**

1. What is the new version TCP/IP model & make a comparison between the old version and the latest version with proper explanation with examples (10 Marks)
2. Explain the purpose of the original TCP/IP layers with proper diagrams (08 Marks)
3. Compare and contrast the OSI reference model and TCP/IP Model with a proper diagram (07 Marks)

**Part B**  
**Answer ONLY TWO questions.**

**Question 03\_ (Total 25 marks)**

1. Explain the purpose of the data link layer with justifications (08 Marks)
2. Explain how the Go-Back-N ARQ works (07 Marks)
3. Why do we need the network layer? Justify with proper examples (10 Marks)

**Question 04\_ (Total 25 marks)**

Imagine you are building a small network for your home to full fill the below requirements

- To connect 6 Desktop computers, 9 Laptops and 10 Smart Mobiles
- 5 Desktop computers are for gaming purposes
- 4 Smart TVs
- Should have an internet connection

1. What are the basic hardware that you would recommend and justify your selection? (06 Marks)
2. If you need to select a Switch or Hub, which device will you choose and why? (07 Marks)
3. What are the transmission mediums that you recommend to connect these devices, and briefly explain the reason (05 Marks)
4. Propose an average internet connection speed for the company considering 1 Mbps per device, and justify your answer (No need to mention ISP name) (07 Marks)

**Question 05\_ (Total 25 marks)**

1. How does your internet connection communicate data? Explain by using multiplexing (06 Marks)
2. Find an internet checksum for the following binary packet sequences
  - I. 10011101 10101101
  - II. 10011111 11110110
  - III. 11011010 11010101
  - IV. 10010111 10110101
  - V. 11101101 10110111
  - VI. 10011010 10101010 (06 Marks)
3. briefly explain the purpose of the Logical addressing in the network layer (06 Marks)
4. Compare and contrast circuit switching and packet switching with examples (07 Marks)

**Question 06\_ (Total 25 marks)**

Chamila is transferring a file with Lahiru via the internet. Due to bad weather conditions and technical issues, the connection is unstable. Internet provided using 4G connection

1. Explain what types of interferences might be there during the transmission (08 Marks)
2. What would happen if the data packet was lost during the transmission? Explain with one of the ARQ techniques (08 Marks)
3. Explain the above mention communication with a sample diagram by using the selective - reject ARQ technique (09 Marks)

**- END OF THE PAPER-**