NATIONAL SCHOOL OF BUSINESS MANAGEMENT

BSc. In Management Information Systems (Special) – 20.1
BSc. (Honours) in Software Engineering – 20.1
BSc. (Honours) in Computer Science – 20.1
BSc. (Honours) in Computer Networks – 20.1
BSc. (Hons) in Management Information Systems – 20.1

Year 01 Semester 02 Examination
20-12-2020
CN101.3 Data Communication & Networks

Instructions to Candidates

1) Answer all questions.

2) Total Number of Pages – 3 pages

3) Time allocated for the examination is three (03) hours and 30 minutes (Including downloading and uploading time)

4) Weightage of Examination: 60% out of final grade

5) Download the paper, provide answers in a word document.

6) Please upload the document with answers (Answer Script) to the submission link before the submission link expires. 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.

11) Your answers will be subjected to Turnitin similarity check, hence, direct copying and pasting from internet sources, friend's answers etc. will be penalized.

Answer all questions

Question 01 **(20 Marks)**

   a. Name all the layers in TCP IP protocol layered architecture and OSI seven-layered architecture. (4 Marks)

   b. Explain why layering / layered architecture is important in data communication and networking. (3 Marks)

   c. Compare and contrast TCP IP protocol architecture and OSI seven-layer architecture. (4 Marks)

   d. Briefly explain how OSI seven-layer architecture applies when sending an email to recipient. (5 Marks)

   e. Compare and contrast channel capacity, data rate and bandwidth. (4 Marks)

Question 02 **(20 Marks)**

   a. Explain the difference between bounded and unbounded transmission media. (3 Marks)

   b. Explain why parabolic dish type antennas are being used over traditional antennas in satellite transmission. (3 Marks)

   c. Explain what type of signals are capable of transmitting in optical fiber cables and explain how optical fiber cables transmit digital signals. (5 Marks)

   d. Crosstalk is a transmission impairment which can occur during the data communication. Explain which transmission media is vulnerable for crosstalk and why. (4 Marks)

   e. Explain the difference between terrestrial microwaves and satellite microwaves. (3 Marks)

   f. What is the difference between broadcast link and point to point satellite configurations. (2 Marks)

Question 03 **(20 Marks)**

   a. Explain what is meant by an error in data communication. (2 Marks)

   b. There are two possible errors in data communication. What are they and explain their characteristics. (4 Marks)

   c. Briefly explain what is meant by Parity checker and Internet checksum. (5 Marks)

   d. Explain when to use internet checksum and explain how error detection happens in internet checksum. (5 Marks)

e. Consider following data packets which transferred and received as 16 bits data packet.

Transmitted data packet

1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	0

Received data packet

1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	0

    I.   By considering above data packets suggest an error detection method which can apply to detect above transmission error. (2 Marks)

    II.   Explain why you recommend above mentioned error detection method.

(2 Marks)

Question 04   **(20 Marks)**

a. Explain what is meant by multiplexing in data communication and provide an example.

(3 Marks)

b. Explain the difference between TDM and FDM multiplexing technologies. (4 Marks)

c. Explain what kind of situation that you can use FDM over TDM. Explain your answer.

(3 Marks)

d. In FDM there is a possibility for transmission impairment. Name the possible transmission impairment and explain how it occur during the transmission.

(4 Marks)

e. Explain what is meant by a periodic signal. (3 Marks)

f. A radio wave has frequency of 0.7kHz and wavelength of 0.20km. Calculate the velocity of the radio wave. (Include workings and formulas) (3 Marks)

Question 05   **(20 Marks)**

a. Explain what is meant by a communication network. (3 Marks)

b. Explain the process of circuit switching by using a suitable example. (3 Marks)

c. Explain the process of packet switching by using a suitable example (3 Marks)

d. Compare and contrast Virtual circuit and Datagram approaches. (4 Marks)

e. Explain what is meant by flow control in data communication. (3 Marks)

f. Compare and contrast Go-Back-N ARQ and Selective Reject ARQ. (4 Marks)

****** End of the paper******