# PURBANCHAL UNIVERSITY
## 2009

Bachelor in Information Technology (B.I.T.)/Fifth Semester/Final
Time: 03:00 hrs. Full Marks: 60 /Pass Marks: 24
BIT312CS: Data Communication

*Candidates are required to give their answers in their own words as far as practicable.*

*Figure in the margin indicate full marks.*

Answer FIVE questions. 5×12=60

1. There are several network layer models proposed in the OSI model. Find all of them. Explain the differences between them. 12

2(a) What is Encoding of analog signal into digital data? Explain different types of Encoding digital data into analog signal. 1+7

(b) What is interfacing? Discuss its characteristics. 1+3

3(a) Discuss the concept of redundancy in error detection. Given a 10 bit sequence, 1010011110 and a divisor of 1011, find the CRC, check your answer. 2+4

(b) What is Piggybacking? Discuss Go Back-N ARQ error control protocol. 6

4(a) Distinguish between synchronous and statistical TDM. 3

(b) Why is circuit switching inefficient for the transmission of non-voice data? Discuss two popular approaches to packet switching. 2+3

(c) What is routing? Discuss routing function. 1+3

5(a) Explain and design the flow diagram for the CSMA/CD. A network using CSMA/CD has a bandwidth of 10 Mbps. If the maximum propagation time is 25.6 μs, what is the minimum site of the frame? 5+4

(b) What is the channel capacity for teleprinter channel with a 300 Hz bandwidth and a signal to noise ratio of 3dB? 3

6. Write short notes on any FOUR: 4×3=12
   (a) HDLC
   (b) PCM
   (c) Traffic control management
   (d) Signaling function
   (e) Manchester Encoding technology



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Answer FIVE questions. 5×12=60

1(a) Write about Channel Capacity. Calculate the maximum data rate the telephone channel can handle if its SNR is specified to be 40 dB. 2+4

(b) How can be LAN differentiated from MAN and WAN? 2

(c) FDM technique is used in telephony system? 4

2(a) Explain how analog voice is converted into digital voice in telephone network. Hence calculate the nominal data rate of digitized voice. 6

(b) Write about the Go-Back N-ARQ error control protocol. 6

3(a) Explain the synchronous and asynchronous transmission in digital data communication technique. 7

(b) Brief the protocols associated with computer communication architecture. 5

4(a) Write about the circuit switching technology used in WAN. 6

(b) What do you mean by control signaling and list their functions? 6

5(a) Write about ISDN System and it architecture with general block diagram. 6

(b) Write about the channel combination principle used in N ISDN system

Contd...

(2)

(c) How is B-ISDN different from N- ISDN? 2

6. Write short notes on (Any FOUR): 4×3=12
   (a) Spectrum of a signal and its effective bandwidth
   (b) HDLC Protocol
   (c) Scrambling technique uses in line encoding
   (d) RS — 232C Interface
   (e) Manchester Encoding technique
   (f) Bit Error Rate (BER)

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# PURBANCHAL UNIVERSITY

## V SEMESTER BACK-PAPER EXAMINATION–2008

**LEVEL:** B. I. T. (Bachelor in Information Technology)

**SUBJECT:** BIT312CS, Data Communication

**Full Marks:** 60

**TIME:** 03:00 hrs. **Pass Marks:** 24

*Candidates are required to give their answers in their own words as far as practicable.*

*All questions carry equal marks. The marks allotted for each sub-question is specified along its side.*

## GROUP-A: LONG-ANSWER TYPE QUESTIONS

**Answer TWO questions.** **[2×12=24]**

**Q. [1]** **[a]** Describe with figure the construction of step-index single mode optical fibre. Differentiate terrestrial microwave communication and radio broadcast.

**[b]** List and explain three main transmission impairments.

**Q. [2]** **[a]** Manchester encoding is a self-clocking code. Explain. Draw the Manchester encoding format for a bit pattern 10011000.

**[b]** State and explain the advantages and disadvantages of synchronous transmission.

**Q. [3]** **[a]** Explain Hamming distance with respect to a pair of coded words. Describe a conceptual single bit error correcting code.

**[b]** Write a short note on circuit-switching techniques internal to a single circuit-switching-mode.

**Contd. ...**



## GROUP-B: SHORT-ANSWER TYPE QUESTIONS

**Answer SIX questions.** **[6×6=36]**

**Q. [4]** Describe with figure the architecture of ATM Network.

**Q. [5]** State and explain four different open-loop congestion control policies.

**Q. [6]** Define protocol. Explain the following protocol function (i) encapsulation (ii) segmentation and reassembly and (iii) flow control.

**Q. [7]** Discuss CSMA/CD as implemented in Ethernet.

**Q. [8]** Differentiate between virtual circuit approach and datagram approach used in packet switching technology.

**Q. [9]** Discuss and differentiate between synchronous TDM and statistical TDM.

**Q. [10]** **Write short notes on [any TWO]:**

**[a]** ISDN architecture

**[b]** LAN/WAN Technology

**[c]** Evolution of data communication

PURBANCHAL UNIVERSITY

2011

Bachelor in Information Technology (B.I.T.)/Fifth Semester/Final

Time: 03:00 hrs. Full Marks: 60 / Pass Marks: 24

BIT312CS: Data Communication

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

**Answer FIVE questions.**

1(a) What is protocol? What are the roles of protocol in Data communication? Discuss key elements of protocol. 3

(b) What are standards? Explain the principal advantages and disadvantages. 3

(c) Describe transmission impairments. 3

(d) What do you mean by Digital transmission? Explain advantages and disadvantages of digital transmission. 3

2(a) Evaluate the maximum bit rate for a channel having bandwidth 3100 Hz and S/N ratio to 20dB. 4

(b) Explain performance comparison of wired media. 5

(c) What is channel capacity? Explain Bit rate and Baud rate with help of diagram. 3

3(a) What is data encoding? Explain frequency shift keying with their advantages and disadvantages. 3

(b) How does parity checking fail to detect errors? Given a 10 bits sequence 1010001101 and a divisor of 110101, find the CRC, check your answer. 6

(c) What is switching? Explain packet switching. 3

4(a) Briefly explain the sliding Window protocol. 6

(b) Briefly explain ARQ techniques. 6



5(a) What is multiplexing? Explain advantages, disadvantages and applications of FDM. 4

(b) Compare circuit switching, message switching and packet switching. 3

6(a) What is Routing? What are the routing functions? Explain types of Routing. 5

(b) What is ISDN? Explain the help of block diagram, architecture of ISDN. 4

(c) Briefly explain TCP/IP Protocol Architecture. 3

(d) What is congestion? What are the causes of congestion? Explain types of congestion control in Datagram Subnet. 5



PURBANCHAL UNIVERSITY

2010

Bachelor in Information Technology (B.I.T.)/Fifth Semester/Final

Time: 03:00 hrs. Full Marks: 60 / Pass Marks: 24

BIT312CS: Data Communication

*Candidates are required to give their answers in their own words as far as practicable.*

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**Group A:**

**Answer TWO questions.** 2×12=24

1. Differentiate between the asynchronous and synchronous data transfer format for serial communication. Describe the parity check error detection technique used in digital data communication system. 6+6

2(a) Explain the packet switching principle and its advantages over circuit switching. 6

(b) What do you mean by congestion? Explain how congestion is controlled. 6

3(a) What are the advantages of optical fibre over twisted pair and coaxial cable? 5

(b) Describe data communication system along with block diagram in detail. 7

**Group B:**

**Answer SIX questions.** 6×6=36

4. What is routing? What re the desirable characteristics of a good routing? 6

5. A receiver receives the code 11001100111. When it uses the Hamming encoding algorithm, the result is 0101. Which bit is in error? What is the correct code? 6

6. Explain stop and wait ARQ and Go-back N ARQ in brief. 6

7. What are the various Transport layer protocols? Explain any one of them in brief. 6

Contd ...



8. Define Broadband ISDN. Mention the data link protocols used by ISDN. 2+4

9. Define control signaling and explain its role in data transmission. 6

10. Describe ASK, FSK and PSK in brief. 6

11. Write short notes on any TWO 3+3
    (a) S/N Ratio
    (b) LAN/WAN Technology
    (c) Sliding Window protocol

# PURBANCHAL UNIVERSITY

## 2016

Bachelor in Information Technology (B.I.T.)/Fifth Semester/*Final*

Time: 03:00 hrs. Full Marks: 60 /Pass Marks: 24

**BIT372CO: Data Communication** *(New Course)*

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

### Group A

**Answer TWO questions.** **2×12=24**

1(a) Define Data Communication System with the help of simple communication model. 6

(b) Differentiate TCP/IP protocol architecture with OSI model. 6

2(a) What is baud rate? What do you mean by asynchronous and synchronous mode of data transfer for serial data communication? Explain these modes with their data formats and mention possible errors. 1+3+3

(b) Write about the parity check error detection technique used in digital data communication system. 5

3(a) Explain the concepts of modulation. Compare AM with FM. 6

(b) Explain about wireless LAN technology. 6

### Group B

**Answer SIX questions.** **6×6=36**

4. Explain the principles of cellular network.

5. What are the signal encoding techniques? Explain Analog Data Digital Signal encoding techniques.

6. Explain about FDM with block diagram.

7. What is switching? Explain the technique for packet switching principles in brief.



8. Explain LAN protocol architecture. How does it differ from bridge and switch?

9. Calculate the maximum data rate of the telephone channel can handle if its SNR is specified to be 24db.

10. Write short notes on any TWO:

(a) 2G CDMA

(b) IPV4

(c) Wireless propagation



# PURBANCHAL UNIVERSITY

## 2014

Bachelor in Information Technology (B.I.T.)/Fifth Semester/*Final*

Time: 03:00 hrs. Full Marks: 60 /Pass Marks: 24

**BIT372CO: Data Communication** *(New Course)*

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### Group A

**Answer TWO questions.** **2×12=24**

1. What is transmission error? Explain different types of error detection methods with examples.

2(a) Explain different techniques used for encoding digital data to analog signal.

(b) What is Transmission impairments. Differentiate between Synchronous and Asynchronous communication.

3(a) What is bridge? Compare Layer2 and Layer3 switch.

(b) What is Multiplexing? Explain STDM with necessary diagrams.

### Group B

**Answer SIX questions.** **6×6=36**

4. How Automatic Repeat Request (ARQ) differ from Stop and What ARQ? Explain in regard to their working mechanism with necessary figures.

5. Explain the function of OSI layer.

6. What are the guided and non guided transmission media? Differentiate between twisted pair and coaxial cable.

7. Why switching is necessary? Differentiate circuit switching with packet switching.

8. What is modulation? Compare FSK, PSK and ASK.

9. Explain LAN protocol architecture.

10. Explain briefly the principle of cellular network with necessary diagrams and explanations.

# PURBANCHAL UNIVERSITY
## 2018

Bachelor in Information Technology (B.I.T.)/Fifth Semester/*Final*
Time: 03:00 hrs. Full Marks: 60 /Pass Marks: 24
**BIT372CO: Data Communication** *(New Course)*

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

### Group A

**Answer TWO questions.** **2×12=24**

1(a) How standars are important in data communication system? 3

(b) Why modulation is needed in communication system? Explain FSK in brief. 4

(c) Discuss packet switching principles and techniques. 5

2(a) Encode the digital data: 1100000000110000010 into digital signal using, 6

(i) Bipolar-AMI
(ii). B8ZS
(iii) HDB3

(b) What is switching? Explain about switched communication network. 6

3(a) Explain different types of congestion control techniques. 6

(b) What is Bit Error Rate? Calculate the maximum data rate of the telephone channel can handle if its SNR is specified to be 24dB. 6

### Group B

**Answer SIX questions.** **6×6=36**

4. What do you mean by cellular wireless network? Discuss about second generation CDMA. 6

5. What are the different types of errors in digital transmission system? Explain error detection and correction method in brief. 6



6. What is piggybacking? Discuss Go-Back-N ARQ error control protocol. 6

7. Explain FDM and TDM in detail. 6

8. Distinguish between ipv4 and ipv6. Draw figure of both ipv4 and ipv6 header too. 6

9. What is wireless propagation? Explain about wireless LAN technology. 6

10. Write short notes on any TWO: 3+3
(a) Transmission Impairment
(b) ADSL
(c) HDLC



# PURBANCHAL UNIVERSITY
## 2017

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**BIT372CO: Data Communication** *(New Course)*

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### Group A

**Answer TWO questions.** **2×12=24**

1(a) Explain different types of Wireless LAN Technologies. 6

(b) What is Congestion? Explain any three congestion control techniques. 6

2(a) How does single bit error differ from burst error? 2

(b) What is the purpose of Guard Band in frequency division multiplexing? 2

(c) Explain about FDM with a block diagram. 8

3(a) Define Internet Protocol. Compare and contrast IPV4 and IPV6. 6

(b) Explain Polar encoding techniques with relevant examples. 6

### Group B

**Answer SIX questions.** **6×6=36**

4. What is switching? Explain about circuit and packet switching.

5. Given the bit pattern 01100. Encode this data using ASK, BFSK, and BPSK.

6. Discuss parity check and types of errors it can and cannot detect with appropriate examples.

7. What is CDMA? Explain its advantages and disadvantages for a cellular network.

8. Define fiber channel. Discuss different topologies supported by fiber channel.

Contd



9. Describe HDLC considering different fields in their frame format.

10. Write short notes on any TWO:
(a) Transmission Impairment
(b) ADSL
(c) VPN