

COMP 6 – 6 (RC)

T.E. (Computer) (Semester – VI) (RC) Examination, Nov./Dec. 2017 DATA COMMUNICATION

Duration : 3 Hours

Total Marks : 100

Instruction : Attempt **any five** questions by selecting at least **one** question from **each** Module.

MODULE – I

1. a) A line has signal to noise ratio of 28 db and frequency spectrum between 6 MHz to 8 MHz. Calculate the maximum capacity of an ideal channel. 4
- b) State the following :
 - i) Information as a quantity
 - ii) Nyquist's theorem
 - iii) NEXT
 - iv) Signaling element.
- c) Explain the relationship between horizontal and vertical cabling standard and also state the different UTP cable categories. 7
- d) Explain bit timing w.r.t. accurate transmission and reception of data. 5

2. a) Explain with a neat diagram satellite radio link system. 6
- b) Explain the following :
 - i) Virtual private network
 - ii) Baudot code
 - iii) VART.
- c) State the following :
 - i) Isochronous transmission
 - ii) Limitation of morse code
 - iii) Strobe pulse
 - iv) Signaling element
 - v) Escape character.5

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MODULE – II

3. a) Explain in detail continuously variable slope delta modulation (CVSD).
b) For the bit stream 01101101, sketch the waveform using the following encoding techniques.
i) Differential Manchester
ii) NRZ-I.
c) Explain with a neat diagram TDMA based satellite transmission system.
d) Explain the following :
i) Compromise equalizer w.r.t. to modem transmitter
ii) FSK based modulation
iii) Numerical aperture.
4. a) Explain ADPCM technique.
b) With a neat diagram explain the adaptive equalizer block of modem receiver circuit.
c) Describe the construction of an optical fibre and also state absorption losses w.r.t. optical fibre.
d) State the following w.r.t. RS-232 interface :
i) DSR pin
ii) Ring indicator pin
iii) Ground limitation
iv) DCD pin.

MODULE – III

5. a) Explain the different frame relay transmission metrics.
b) Explain with a neat diagram HDLC format.
c) Explain the different time outs in BiSYNC.
d) Explain the different protocol layers that X.25 standard specifies at the serial interface gateway.

6. a) Explain the different layers of OSI reference model and also state its importance. 7
- b) Draw and explain how congestion control is handled in frame relay networks. 4
- c) State what is dialing directory. 3
- d) State the following : 6
- i) Echoplex
 - ii) Virtual call service of X.25
 - iii) BISYNC character set.

MODULE – IV

7. a) Explain the ISDN primary access method with T1 frame format. 6
- b) Explain with a neat diagram ATM protocol reference model. 8
- c) Explain the relationship of ISDN to the OSI reference model. 6
8. a) Write a short note on : 10
- i) ATM LANE protocol
 - ii) Video-Conferencing as application of ISDN.
- b) Explain ATM user network interface (UNI) options with a neat diagram. 4
- c) Explain the following : 6
- i) 3G Networks
 - ii) 2B1Q data format w.r.t. ISDN.

COMP 6 – 6 (RC)

T.E. Computer (Semester – VI) (RC) Examination, May/June 2017 DATA COMMUNICATION

Duration : 3 Hours

Total Marks : 100

Instruction : Attempt **any five** questions by selecting atleast **one** question from **each Module.**

MODULE – I

1. a) A line has signal to noise ratio of 26 db and frequency spectrum between 7 MHz to 9 MHz. Calculate the maximum capacity of an ideal channel. 4
- b) Explain the relationship between horizontal and vertical cabling standard and also state the different UTP cable categories. 7
- c) Explain the following networking devices :
 - i) Switch
 - ii) Bridge.6
- d) Define the following :
 - i) NEXT
 - ii) Bit framing
 - iii) Two state communication system.3
2. a) Explain the following :
 - i) Baudot code
 - ii) Virtual private network.6
- b) Explain with a neat diagram cellular radio system. 6
- c) State the following:
 - i) Isochronous transmission
 - ii) Baud rate
 - iii) Strobe pulse.3
- d) Explain the universal seven part data circuit with a neat diagram. 5

P.T.O.

MODULE – II

3. a) Explain the different types of analog _____ Modulation techniques. 5
b) For the bit stream 01011011, sketch the waveform using the following encoding techniques. 4
i) RZ
ii) Differential Manchester. 6
c) With a neat diagram explain the modem receiver block circuit. 6
d) Explain the following : 5
i) Limitations of Rs. – 232
ii) Vocoding techniques.
4. a) Explain with a neat diagram the process of pulse code Modulation. 6
b) State the following w.r.t. Rs. – 232 3
i) DSR pin
ii) RI pin
iii) DCD pin.
c) Explain the functioning of DNDM with a neat diagram.
d) Explain with a neat diagram STDM operation and also state how it is different from TDM. 6

MODULE – III

5. a) State the following BISYNC link control codes :
i) NAK
ii) ENQ
iii) RVI
iv) ETX.
b) Explain X.25 packet header with a neat diagram and also state how to identify a data packet in X.25.
c) Differentiate between XMODEM and YMODEM protocol.
d) Explain the following :
i) KERMIT protocol
ii) LAPB procedures.

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7. a) Explain the composition of frame relay frame with a neat diagram.
b) With an example explain the cyclic redundancy check method.
c) Explain the HDLC format with a neat diagram.
d) State the following :
i) CIR w.r.t. frame relay networks.
ii) Permanent virtual circuit service w.r.t. X.25.
iii) Continue timeout w.r.t. BISYNC.
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MODULE – IV

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COMP 6 – 6 (RC)

T.E. (Comp.) (Semester – VI) (RC) Examination, November/December 2016 DATA COMMUNICATION

Duration : 3 Hours

Total Marks : 100

Instruction : Attempt any five questions by selecting at least one question from each Module.

Module – I

1. a) A telephone line has a bandwidth of 400 Hz to 4400 Hz and SNR = 45 dB.
Calculate the channel capacity (Max data rate). 4
- b) Explain Satellite Radiolink System with a neat diagram. 6
- c) Explain the following :
 - 1) Baudot code
 - 2) Backbone cabling.6
- d) Give the advantages of PC as terminal. 4

2. a) What are carrier systems ? Explain how bandwidth can be allocated to carry signals in a medium using TDM method. 7
- b) Explain the following :
 - 1) Serial and parallel data transmission.
 - 2) Twisted pair wires.6
- c) State few advantages of fibre optic system. 2
- d) Explain with a neat diagram the universal seven part data circuit. 5

Module – II

3. a) Draw and explain modem transmitter with block diagram. 6
- b) Draw the waveforms for the following bit stream 10011110 using following encoding techniques. 6
 - 1) NRZ – I
 - 2) Manchester encoding.
 - 3) AMI.
- c) With the help of a neat diagram explain pulse code modulation. 5

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- d) State the following terms :
- 1) Baud rate
 - 2) Numerical Aperture.
 - 3) Nyquist theorem.
4. a) Describe the various components used for construction of fibre optic system. 7
- b) Explain the different voice digitization methods. 6
- c) Explain RS – 232 D pin layout with a neat diagram. Also state limitations of RS – 232 with respect to distance and speed. 7

Module – III

5. a) Explain the composition of the frame relay frame with a neat diagram. 7
- b) What are Packet Networks ? State some advantages of packet switching networks. 3
- c) Draw and explain HDLC format. 5
- d) Compare X.25 versus frame relay networks. 5
6. a) Explain X.25 packet header and X.25 data packet with a neat diagram. 8
- b) Define the term "Echoplex". 2
- c) Explain the following : 8
- 1) XMODEM protocol block format.
 - 2) Cyclic redundancy checks.
- d) What is dialing directory ? 2

Module – IV

7. a) Explain the architecture of a 53-byte ATM cell with a neat diagram. 8
- b) Explain ISDN basic access channel format with a neat diagram. 6
- c) Write short notes on : 6
- 1) SEAL
 - 2) TDMA
8. a) Explain how cell routing happens in an ATM Network. 7
- b) State primary characteristics of an ISDN network. 5
- c) Write short notes on : 8
- 1) 3G Networks
 - 2) ATM Services.

COMP 6 – 6 (RC)

T.E. (Comp) (Semester – VI) (RC) Examination, May/June 2016 **DATA COMMUNICATIONS**

Duration : 3 Hours

Total Marks : 100

Instruction : Attempt **any five** questions by selecting atleast **one** question from **each Module.**

MODULE – I

1. a) A telephone line has a bandwidth of 200 Hz to 2200 Hz and SNR = 25 dB. Calculate the channel capacity (max data rate). 4
b) Explain satellite radiolink system with a neat diagram. 6
c) State the following :
 - 1) Two state communication system. 4
 - 2) NEXT. 4d) Explain effects of bandwidth on a transmission channel. 6
2. a) Explain in detail the term "Information as a Quantity". 3
b) Explain the following terms :
 - 1) Bit timing 2) Bit framing 3) Waveguide. 6c) Explain the different backbone cabling standard and UTP cable categories. 6
d) Draw and explain the universal seven part data circuit. 5

MODULE – II

3. a) Explain the following :
 - 1) TDMA
 - 2) Continuously variable slope delta modulation.b) Draw the waveforms for the following bit stream 111010011 using the following encoding techniques :
 - 1) NRZ-I
 - 2) RZ
 - 3) Manchester encoding.6

P.T.O.

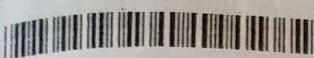
COMP 6 – 6 (RC)

- | | | |
|--|---|--|
| COMP 6 – 6 (RC) | | |
| c) Explain the functioning of Dense WDM system with a neat diagram. | 5 | |
| d) State the following terms : | 3 | |
| 1) Demand Assignment Multiple Access (DAMA). | | |
| 2) Numerical Aperture. | | |
| 3) Nyquist theorem. | | |
| 4. a) Explain in detail statistical time division multiplexing. | 6 | |
| b) Draw and explain modern receiver block diagram. | 6 | |
| c) Explain in detail the asynchronous auto answer modem. | 6 | |
| d) State the limitations of RS-232 with respect to distance and speed. | 2 | |

MODULE – III

- | | | |
|----|--|---|
| 5. | a) Explain how congestion control is handled in a frame relay network. | 5 |
| | b) Draw and explain OSI reference model. | 6 |
| | c) Explain the different services provided by X.25 standard. | 4 |
| | d) Explain XMODEM protocol block format with a neat diagram. | 5 |
| 6. | a) Explain the different link control codes used in Bisync procedures. | 5 |
| | b) Explain the following : | 6 |
| | 1) Dialing directory. | |
| | 2) Advantages of packet switching networks. | |
| | c) Compare X.25 versus frame relay networks. | 4 |
| | d) Explain cyclic redundancy check method with an example. | 5 |

MODULE – IV



T.E. COMP (Semester – VI) (RC) Examination, Nov./Dec. 2015
DATA COMMUNICATION

Duration : 3 Hours

Total Marks : 100

Instructions : 1) Answer **any five** questions by selecting at least **one** from each Module.
2) Make suitable assumptions if **required**.
3) Draw neat sketches **wherever** necessary.

MODULE – 1

- | | | |
|----|--|---|
| 1. | a) Write a short note on teleprinters and state their disadvantages. | 5 |
| | b) Give a general description of data communication systems. | 6 |
| | c) Write a short note on satellite communication and list the different types of satellites. | 9 |
| 2. | a) Write a short note on the following networking devices : | |
| | i) Bridges | 6 |
| | ii) Routers. | 6 |
| | b) What are the different types of twisted pair cables and list their advantages ? | 6 |
| | c) Give the advantages of PC as a terminal. | 4 |
| | d) Differentiate between serial and parallel transmission. | 4 |

MODULE - 2

3. a) With respect to the RS-232 interface explain the purpose of the following signals : 8

i) CTS ii) RTS iii) DTR iv) DCD

b) Explain with help of an example unipolar and bipolar NRZ line coding technique. 6

c) What is ones density ? What are the techniques used to support it ? 6

4. a) Explain the different types of losses encountered in fiber optics. 8

b) Write a short note on Time division multiple access. 6

c) Write a short note on carrier amplitude and phase modulation. 6



MODULE - 3

5. a) Explain congestion control in a frame. 6
b) Explain timeouts in BiSync. 6
c) With a neat diagram describe the OSI reference model. 8
6. a) Explain with a neat diagram the composition of Frame relay frame. 7
b) Explain SDLC message format in detail. 7
c) Write a short note on Hyperterminal. 6

MODULE - 4

7. a) Write a note on 'network connection' in ATM. 4
b) Explain the various application of ISDN. 8
c) Write a short note of Personal Communications Systems. 6
d) Explain the purpose of the cell loss priority field in an ATM header. 2
8. a) Explain the ATM protocol reference model. 8
b) Write short notes on :
i) CDMA
ii) TDMA 8
- c) With the help of a neat diagram explain the ISDN basic access channel format. 4



COMP – 6-6 (RC)

T.E. COMP (Semester – VI) (RC) Examination, Nov./Dec. 2015
DATA COMMUNICATION

Duration : 3 Hours

Total Marks : 100

Instructions : 1) Answer **any five** questions by selecting at least **one** from each Module.
2) Make suitable assumptions if **required**.
3) Draw neat sketches **wherever** necessary.

MODULE – 1

MODULE - 2

3. a) With respect to the RS-232 interface explain the purpose of the following signals : 8

i) CTS ii) RTS iii) DTR iv) DCD

b) Explain with help of an example unipolar and bipolar NRZ line coding technique. 6

c) What is ones density ? What are the techniques used to support it ? 6

4. a) Explain the different types of losses encountered in fiber optics. 8

b) Write a short note on Time division multiple access. 6

c) Write a short note on carrier amplitude and phase modulation. 6

P.T.O.

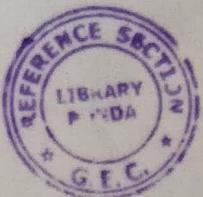
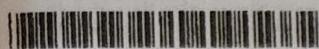


MODULE - 3

5. a) Explain congestion control in a frame. 6
b) Explain timeouts in BiSync. 6
c) With a neat diagram describe the OSI reference model. 8
6. a) Explain with a neat diagram the composition of Frame relay frame. 7
b) Explain SDLC message format in detail. 7
c) Write a short note on Hyperterminal. 6

MODULE - 4

7. a) Write a note on 'network connection' in ATM. 4
b) Explain the various application of ISDN. 8
c) Write a short note of Personal Communications Systems. 6
d) Explain the purpose of the cell loss priority field in an ATM header. 2
8. a) Explain the ATM protocol reference model. 8
b) Write short notes on :
i) CDMA
ii) TDMA 8
c) With the help of a neat diagram explain the ISDN basic access channel format. 4



COMP 6 – 6 (RC)

T.E. (COMP) (Semester – VI) (RC) Examination, May/June 2015 DATA COMMUNICATION

Duration : 3 Hours

Total Marks : 100

- Instructions :**
- 1) Answer **any five** questions by selecting at least **one** from each Module.
 - 2) Make suitable assumptions **if required**.
 - 3) Draw **neat** sketches wherever necessary.

MODULE – 1

1. a) Differentiate between gateways and bridges. 4
 - b) Give the advantages of PC as a terminal. 4
 - c) Explain the term escape character. 4
 - d) Write a short note on the following :
 - i) NEXT
 - ii) Intersymbol interference. 8
-
2. a) Explain the term 'Information as a quantity' in detail. 4
 - b) Explain with a neat diagram cellular telephony. 7
 - c) Explain the different modern codes used in data communication. 6
 - d) What is world wide wait and how was this problem tackled ? 3

MODULE – 2

3. a) Explain in detail the limitations of RS-232 interface. 7
 - b) Explain the working of an adaptive equalizer with respect to synchronous modems. 7
 - c) Explain the different voice digitization methods. 6
-
4. a) Describe the various components used for construction of fiber optic system. 8
 - b) With the help of a neat diagram explain pulse code modulation. 6
 - c) Explain with a neat block diagram the components of a synchronous modem receiver. 6

P.T.O.



MODULE – 3

5. a) Explain in detail the HDLC frame format. 6
b) Explain in detail the concept of a dialing directory with respect to communication programs. 6
c) With the help of a neat diagram describe the contents of the Frame relay frame. 8
6. a) With the help of an example the cyclic redundancy checks. 8
b) Explain the different link control codes used in BISYNC. 7
c) Write a short note on Dial up Networking. 5

MODULE – IV

7. a) With neat diagrams describe the payload formats specified by different types of AAL layers. 6
b) Write a short note on AMPS. 4
c) Explain the two methods of access to ISDN. 8
d) What are cause codes in ISDN ? 2
8. a) Explain the ATM protocol reference model. 8
b) Write short notes on : 8
 i) CDMA
 ii) GSM.
c) Explain briefly the inverse multiplexer. 4



COMP 6 – 6 (RC)

T.E. (Comp.) (Semester – VI) (RC) Examination, Nov./Dec. 2014

DATA COMMUNICATIONS

Duration : 3 Hours

Total Marks : 100

- Instructions:**
- 1) Figures to the right indicate **full marks**.
 - 2) Answer **any 5 questions**, selecting at least **one question from each Module**.
 - 3) Make suitable assumptions if required.

MODULE – I

1. a) Explain the following terms :
i) Virtual private network
ii) UART
b) Explain with a neat diagram the basic telegraph system.
c) Explain with a neat diagram the cellular Radio System.
2. a) Consider a channel with spectrum between 3 MHz to 4 MHz and SNR_{db} = 24 db, calculate, channel capacity.
b) Write short notes on :
i) Portable computer
ii) Emerging technologies
c) Explain in detail the escape character.

(4×2=8)

6

6

6

6

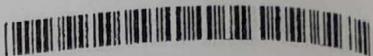
6

6

MODULE – II

3. a) For the bit stream 01100011, sketch the waveforms for the following encoding techniques.
i) NRZ – I
ii) Manchester encoding
iii) Differential Manchester

P.T.O.



- b) Explain in detail the dense WDM system.
- c) Describe the construction of an optical fiber.
4. a) Explain in detail adaptive equalizer with respect to synchronous modems.
- b) What is Snells law ?
- c) Explain in detail the asynchronous autoanswer modem.
- d) What is FDM ?

MODULE – III

5. a) Explain the general format of X.25 data packets.
- b) Write a short note on "Dial-up networking".
- c) Explain in detail frame format and data flow in context to frame relay.
6. a) Explain key difference between frame relay and X.25.
- b) Write short notes on :
- i) Hyperterminal
 - ii) Kermit protocol
- c) How protocols are different from interfaces ? Explain.
- (5×2=10)

MODULE – IV

7. a) Explain with a neat diagram the architecture of ATM.
- b) Explain the various characteristics and applications of ISDN.
- c) Explain in brief AMPS.
8. a) Explain in detail ISDN reference points and network interfaces.
- b) Explain ISDN Basic Access Method.
- c) Write a short note on :
- i) PCS
 - ii) 3G networks



COMP 6 – 6 (RC)

T.E. (Comp.) (Semester – VI) (RC) Examination, Nov./Dec. 2013 DATA COMMUNICATION

Duration : 3 Hours

Total Marks : 100

- Instructions :**
- 1) Answer **any five** questions by selecting at least **one** from each Module.
 - 2) Make suitable assumptions **if required**.
 - 3) Draw **neat** sketches **wherever** necessary.

MODULE – I

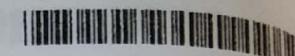
1. a) Suppose that the spectrum of a channel is between 4 MHz to 6 MHz and $\text{SNR}_{\text{db}} = 24 \text{ dB}$, calculate channel capacity. 5
b) Explain the following networking devices : 6
 - 1) Bridges
 - 2) Routers.
 - c) Define the following terms with respect to data communication : 4
 - 1) Codes
 - 2) Characters.
 - d) Explain in detail ASCII code. 5
-
2. a) Compare performance of the following transmission mediums. 8
 - 1) UTP
 - 2) STP
 - 3) Coaxial Cable
 - 4) Fiber optics.
 - b) Explain in detail the term "Information as a Quantity". 2
 - c) Give advantages of PC as a terminal. 4
 - d) Explain the effects of bandwidth on a transmission channel. 6

MODULE – II

3. a) Explain in detail Adaptive Equalizer with respect to synchronous modems. 7
b) Explain in detail the Statistical time Division Multiplexing. 7
c) Describe the construction of an optical fiber. 6

P.T.O.

COMP 6 – 6 (RC)



4. a) What is function of RS-232 interface in a data communication network ? Explain.
Limitations of RS-232 with respect to distance and speed.
- b) Explain in detail continuously variable slope delta modulation.
- c) For a bit stream 01101100, sketch the waveform for :
- 1) NRZ-I
 - 2) NRZ-L
 - 3) Bipolar AMI
 - 4) Manchester.

MODULE – III

5. a) Explain virtual call service of X.25.
- b) Explain timeouts in BiSync.
- c) What is Dialing Directory ? Explain.
- d) Match the following to one of the OSI layer. Justify your answer.
- 1) Network selection
 - 2) Frames defined.
6. a) What is Echoplex.
- b) Compare frame relay and X.25.
- c) Draw and explain OSI reference model.
- d) What is packet network ? What are its characteristics ?

MODULE – IV

7. a) Explain with neat diagram the ATM protocol reference model.
- b) Explain the ISDN Primary Access method.
- c) Explain briefly the inverse multiplexer.
- d) State primary characteristics of an ISDN network.
8. a) Describe architecture of ATM with neat diagram.
- b) Write short notes on :
- 1) TDMA
 - 2) CDMA
 - 3) GSM.

(4x3=12)

COMP 6-6 (RC)

T.E. (Comp.) (Semester – VI) (RC) Examination, May/June 2012

DATA COMMUNICATION

Duration : 3 Hours

Total Marks : 100

- Instructions :**
- 1) Assume suitable data wherever required.
 - 2) Attempt any five questions choosing atleast one from each Module.
 - 3) Draw neat sketches wherever necessary.

MODULE – I

1. a) Suppose that the spectrum of a channel is between 3 MHz to 4MHz and SNRdB = 24 dB, calculate the channel capacity. 5
- b) Explain in brief the following terms :
 - i) EBCDIC
 - ii) ASCII4
- c) Give advantages and disadvantages of optical fibre. 5
- d) Explain with a neat diagram the serial data transmission, also state its advantages and disadvantages over parallel data transmission. 6

2. a) Explain in detail the two forms of twisted pair wire and state its advantages. 6

- b) Give advantages of PC as a terminal. 4

- c) Explain the term the escape character. 4

- d) Write a short note on satellite communication. 6

MODULE – II

3. a) Explain various components used for construction of fiber optic system. 6
- b) With the help of an example explain the Manchester line coding technique. 3
- c) Explain various voice digitization methods. 6
- d) Explain with neat diagrams three analog modulation methods. 5

P.T.O.

COMP 6-6 (RC)

4. a) With respect to fiber optics, explain the following : 3
 i) Numerical aperature ii) Acceptance angle.
- b) Explain in detail adaptive equalizer with respect to synchronous modems. 7
- c) Explain the following signals with respect to the RS-232 standard. 6
 i) Received line signal detector
 ii) Clear to send
 iii) Data terminal ready.
- d) State the advantages of coaxial cable over twisted pair wires. 4

MODULE – III

5. a) Explain Dialling Directory used in procommplus. 5
b) Explain in detail the two types of services used in X.25. 5
c) Explain the XMODEM protocol with the help of a neat block format. 6
d) State advantages of packet switching. 4
6. a) Explain congestion control used in frame. 5
b) Write short notes on : (6x2=12)
 i) Hyperterminal ii) Kermit protocol
c) With the help of a diagram, show a 'normal' sequence of VC setup, two way simultaneous data transfer and terminal initiated disconnection. 3

MODULE – IV

7. a) Explain the two methods of access to ISDN. 8
b) Explain with neat diagram the ATM protocol reference model. 8
c) Explain in brief AMPS. Also state its disadvantages. 4
8. a) Explain CDMA. Explain with an example the direct sequence spreading process. 6
b) With respect to ATM explain the following : 8
 i) AAL1 ii) AAL2
c) Explain the fundamental groupings of ISDN. 6

[Total No. of Questions : 8]

T.E. (Comp.) (Semester - VI) (RC) Examination, Nov. - 2011

DATA COMMUNICATION

3

Duration : 3 Hours

Total Marks : 100

7

- Instructions :*
- 1) Assume suitable data wherever required.
 - 2) Attempt any five questions choosing atleast one from each module.
 - 3) Draw neat sketches wherever necessary.

6

MODULE - I

4

- Q1)* a) Give a general description of data communications systems. [8]
 b) What is Baudot code? Explain. [4]
 c) Describe the effects of bandwidth on a transmission channel. [8]

5

- Q2)* a) Explain the different types of unbounded media. [12]
 b) Write short notes on:
 i) Coaxial cables.
 ii) Use of Redundancy in Data Communications. [4 × 2 = 8]

6

4

5

MODULE - II

=12)

3

- Q3)* a) Explain the following terms with respect to fiber optics. [3]
 i) Numerical Aperture.
 ii) Acceptance Angle.
 iii) Optical Window.
 b) What are the factors that limit the data transmission capability of analog modems. [4]
 c) Give an example of a connection using the RS - 232 interface and explain. [3]
 d) Write a note on Dense Wavelength Division Multiplexing System. [8]
 e) What is Frequency shift keying? [2]

8

8

4

6

8

6

6

8

6

6

- Q4)* a) Explain the following: [2]
 i) PAM
 ii) PPM
 b) Explain the operation of the receiver equalizer in a synchronous modem. [8]
 c) Describe the construction of an optical fiber. [6]
 d) Explain the operation of TDM. [4]



P.T.O.

MODULE - III

- Q5)** a) What is the difference between a protocol and an interface. [2]
 b) Describe the different layers in the OSI reference model. [8]
 c) Given a 10 bit sequence 1010011110 and a divisor of 1011, find the CRC. [4]
 d) Differentiate between X.25 packet networks and Frame Relays. [6]
- Q6)** a) Which protocols would you recommend to use under the following circumstances and why. [4]
 i) Transmission is of poor quality.
 ii) When communicating with computer systems whose operating system cannot support the extended ASCII code and ASCII control characters.
- b) Draw and explain the composition of the Frame Relay frame. [8]
 c) Explain timeouts in Bi Sync. [6]
 d) Differentiate between Multipoint and Point - to - Point Links. [2]

MODULE - IV

- Q7)** a) Explain the various applications of ISDN. [8] Q2
 b) Explain ATM Network connections. [4]
 c) Write a short note on: [4 × 2 = 8]
 i) AMPS.
 ii) CDMA.
- Q8)** a) Explain Basic Access method of ISDN Architecture. [8] 2
 b) What are the characteristics of ATM? [4]
 c) What is 2 BIQ encoding? Explain with an example. [4]
 d) Write a short note on 3G networks. [4]



[Total No. of Questions : 8]

[2]
[8]
[4]
[6]

T.E. (Comp.) (Semester - VI) Examination, May/June 2011
DATA COMMUNICATION

Duration : 3 Hours

Total Marks : 100

- Instructions :*
- 1) Assume suitable data wherever required.
 - 2) Attempt any Five questions choosing at least one question from each Module.
 - 3) Draw neat sketches wherever necessary.

MODULE - I

- Q1)** a) Explain the following terms [4 × 4 = 16]
- i) Virtual Private Network.
 - ii) Intersymbol Interference.
 - iii) UART.
 - iv) NEXT.
- b) What is the effect of inductance loading on wire pairs. [4]
- Q2)** a) Differentiate between serial and parallel transmission of data. [5]
- b) Write short notes on: [2 × 5 = 10]
- i) Two State Communication Systems.
 - ii) Modern Codes.
- c) What are the advantages of Fiber Optic Systems? [5]

MODULE - II

- Q3)** a) What is the need for using Modems? Explain the working of modems and the design of the modem interface. [8]
- b) For the bit stream 01101001 sketch the waveform for each of the following encoding techniques. [4]
- i) Unipolar NRZ encoding.
 - ii) Manchester encoding.
- c) Write a short note on Continuously Variable slope Delta Modulation (CSVD). [4]
- d) What is Snell's Law? Explain. [4]

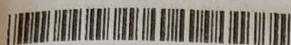
- Q4)** a) Explain the following signals with respect to the RS - 232 standard. [6]
- Received Line Signal Detector.
 - Ring Indicator.
 - Data Set Ready.
- b) Explain the different losses that occur in fibers. [6]
- c) Write a short note on statistical Time Division Multiplexing. [8]

MODULE - III

- Q5)** a) What is Echoplex? [2]
- b) Write a note on "XMODEM protocol and its derivatives". [8]
- c) What is a Dialing Directory. Explain. [6]
- d) Write a short note on Link Protocols. [4]
- Q6)** a) What is a Packet Network? What are its characteristics? [4]
- b) With an example explain cyclic Redundancy Checks. [8]
- c) Draw and explain the HDLC frame format. [8]

MODULE - IV

- Q7)** a) List the main characteristics of an ISDN network. [3]
- b) Describe the architecture of ATM. [8]
- c) Write a short note on CDMA. [5]
- d) Explain the basic infrastructure of mobile communications. [4]
- Q8)** a) Explain the ATM Protocol Reference Model. [8]
- b) Explain the ISDN primary Access Method. [5]
- c) Write a short note on Personal Communication Systems (PCS). [5]
- d) What are cause codes in ISDN. [2]



**T.E. (Comp) (Semester – VI) Examination, November 2010
(Revised 2007 – 08)**

DATA COMMUNICATION

[6]

Duration : 3 Hours

[8]

Total Marks : 100

- Instructions :** 1) Answer any 5 out of 8 questions with a minimum of one question from each Module.
2) Make suitable assumptions if required.

[2]

[8]

MODULE – I

[6]

1. a) Explain the basic telegraph system with diagram.
- 6

[4]

- b) Define with respect to data communication.
- 4

1) Codes

2) Signalling elements.

c) Write a note on importance of data communication. 4

[8]

- d) Explain the following internetworking devices :
- 6

i) Gateways ii) Bridges iii) Routers.

[3]

2. a) With neat diagram, explain optical fiber cable.
- 6

[8]

- b) Explain the different types of UTP cable.
- 6

[5]

- c) Explain :
- 4

1) EBCDIC codes.

2) ASCII codes.

[4]

- d) Explain the effect of bandwidth on a transmission channel. Also write the Shannon's channel capacity formula.
- 4

[5]

MODULE – II

[5]

3. a) Explain the limitation of RS-232 with respect to :
- 6

i) Distance ii) Speed iii) Ground

[2]

- b) What do you understand by the terms 'modulation'? With the help of neat diagram, explain 'Pulse Code Modulation'.
- 8

COMP 6 - 6 (RC)

- c) Write note on 'Loopback Text'. 4
- d) What is 'ADSL'? 2
- 4. a) Explain the operation of statistical TDM. 6
- b) Explain Dense Wavelength Division Multiplexing system in details. 8
- c) Write a note on multiple access system in satellite transmission. 6

MODULE - III

- 5. a) Write note on 'Dial up Networking'. 6
- b) Draw and explain HDLC frame format. 6
- c) Explain 'XMODEM' protocol. What are the drawbacks of XMODEM protocols. 8
- 6. a) Compare X-25 and frame relay. 6
- b) Explain capabilities of X-25. 6
- c) What is packet network? Explain its characteristic. What are the advantages of packet switching? 8

MODULE - IV

- 7. a) Explain the ISDN reference points and network interfaces, with neat diagram. 6
- b) State and explain application of ISDN in brief. 6
- c) Compare the network features of ATM, data communication and telecommunication network. 8
- 8. a) Explain 'AALS' in detail. 6
- b) Explain the following mobile communication systems :
 - 1) TDMA 2) PCS6
- c) Write short notes on :
 - 1) Inverse multiplexer
 - 2) Network connection in ATM.1

T.E. (Comp.) (Semester – VI) (Revised) Examination, May/June 2010
DATA COMMUNICATION

Duration: 3 Hours

Total Marks: 100

Instructions: 1) Answer any 5 out of 8 questions with a minimum of one question from each Module.
 2) Make suitable assumptions if required.

MODULE – I

1. a) Explain the following devices : 6
 - i) Gateways
 - ii) Bridges
 - iii) Routers.
- b) Explain Baudot coding technique. 4
- c) Write a short note on ‘Satellite Communication’. 6
- d) A telephone line has a bandwidth of 300 Hz to 3300 Hz, the signal-to-noise ratio is 3162. Calculate the channel capacity. 4

2. a) With neat diagram explain unshielded twisted pair (UTP) and shielded twisted pair (STP). 6
- b) What are the advantages of a PC as a terminal. 3
- c) Explain the asynchronous and synchronous data transmission methods. 6
- d) List out the standard analog carrier system and digital carrier system. 5

MODULE – II

3. a) With neat diagram, explain a modem transmitter and receiver. 8
- b) For the bit stream 01001110, sketch the waveforms for each of the following encoding techniques : 6
 - 1) Differential manchester
 - 2) NRZ-L
 - 3) Bipolar AMI.
- c) Write note on ‘Cable modem’. 6



- | | | |
|----|--|---|
| 4. | a) Explain the different voice digitization techniques. | 6 |
| | b) Explain with diagram, the model delay with respect to fiber optics. | 4 |
| | c) What are the different types of losses in fiber optics ? | 8 |
| | d) List out the fiber optic components. | 2 |

MODULE – III

- | | | |
|----|--|---|
| 5. | a) Explain SDLC message format in details. | 6 |
| | b) With an example explain cyclic redundancy checks. | 6 |
| | c) Explain the function of microsoft windows 'Hyper Terminal Program'. | 4 |
| | d) Write note on 'Procommplus dialing directory'. | 4 |
| 6. | a) What are the advantages of packet switching ? | 4 |
| | b) Draw and explain OSI reference model. | 8 |
| | c) What is frame relay ? Explain its components and frame format. | 8 |

MODULE – IV

- | | | |
|----|---|-------|
| 7. | a) Explain with diagram the ISDN basic access channel format. | 4 |
| | b) With the help of diagram, explain inverse multiplexer. | 6 |
| | c) Explain ATM protocol reference model in details. | 10 |
| 8. | a) Write short on 'Network Connections' in ATM. | 4 |
| | b) Explain the following mobile communication systems : | 8 |
| | i) AMPS | 2. a) |
| | ii) GSM. | b) |
| | c) Write short note on '3G Networks'. | 7 |
| | d) State various advantages of ATM. | b) |

COMP 6 – 6 (RC)

T.E. (Comp.) (Semester – VI) (RC) Examination, May/June 2013 DATA COMMUNICATION

Duration : 3 Hours

Total Marks : 100

- Instructions :** 1) Answer **any five** questions by selecting at least **one** from each Module.
2) Make suitable assumptions if required.
3) Draw **neat sketches wherever** necessary.

MODULE – I

1. a) We measure the performance of a telephone line (4 KHz of Bandwidth), when the signal is 10 volts, the noise is 5 millivolts. What is the maximum data rate supported by this telephone line ? 5
- b) Explain the following networking devices : 6
 - 1) Routers
 - 2) Gateways
- c) What are the advantages of PC as a terminal ? 3
- d) Explain in detail Baudot coding technique. 6
2. a) State Shannon's theorem. Calculate the capacity of standard 4 KHz telephone channel working in the range of 200 to 2400 Hz with SNR of 32dB. 5
- b) Explain in detail the following bounded mediums 6
 - 1) Coaxial cable
 - 2) Waveguide
- c) Explain in detail the term "information as a Quantity". 3
- d) Explain in detail teleprinters. Also state its disadvantages. 6

COMP 6 – 6 (RC)

MODULE - II

3. a) Explain the purpose of following signals on the V.24/EIA-232 interchange circuit.
- 1) Clear to send
 - 2) Received line signal detector
 - 3) Data signal rate selector
 - 4) Ring indicator.
- b) For the bit stream 01001110, sketch the waveforms for each of the following encoding technique.
- 1) Manchester
 - 2) Bipolar AMI
 - 3) NRZ-L
- c) Write a short note on Time Division Multiple Access (TDMA).

4. a) Explain various voice digitization methods.

b) Explain any 2 types of losses in fiber optics.

c) With respect to fiber optics, explain

- 1) Numerical aperture.
- 2) Acceptance angle.

d) Explain in detail the operation of Asynchronous Autoanswer Modem.

MODULE - III

5. a) Explain the general format of X.25 data packets.
- b) State drawbacks of XMODEM protocol.
- c) Write a note on Dial up Networking.
- d) State advantages of packet switching.
6. a) Explain with a neat diagram the composition of frame relay frame.
- b) Explain with an example the cyclic redundancy checks.
- c) Explain the term synchronization with respect to BiSync.

MODULE - IV

8

7. a) Briefly state the purpose of the following fields in an ATM cell.
- 1) Virtual path identifier
 - 2) Cell loss priority
- b) Explain the various applications of ISDN.
- c) Explain the two methods of access to ISDN.

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8. a) Write short note on 'network connection' in ATM.
- b) Explain the ISDN reference points and network interfaces with a neat diagram.
- c) Write short note on :
- 1) AMPS
 - 2) TDMA.

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