

Government College of Engineering, Amravati
(An Autonomous Institute of Government of Maharashtra)

Fourth Semester B. Tech. (CS/IT)

Summer – 2018

Course Code: ITU402

Course Name: Data Communication

Time: 2 hr. 30min.

Max. Marks: 60

Instructions to Candidate

- 1) All questions are compulsory.
- 2) Assume suitable data wherever necessary and clearly state the assumptions made.
- 3) Diagrams/sketches should be given wherever necessary.
- 4) Figures to the right indicate full marks.

Q.1	Solve the following.	12
	(a) Explain OSI Reference model with neat figure.	
	(b) Define transmission medium. How do guided media differ from unguided media?	
Q.2	Solve any two of the following.	12
	(a) What is multiplexing? Explain TDM.	
	(b) Explain non uniform quantization and how to recover original signal using PCM decoder.	
	(c) Explain analog to analog conversion in details.	
Q.3	Solve any two of the following.	12

Contd.

- (a) Explain phase shift keying in detail. Compare it with FSK.
- (b) What is a draw back of Go Back-n protocol? How it is overcome in the selective repeat protocol.
- (c) Define and explain the concept of Wavelength division multiplexing.
- Q.4** **Solve any two of the following.** **12**
- (a) Explain character oriented protocol in details.
- (b) Explain the role of Hamming code in error detection and correction with example.
- (c) Explain message switching in details.
- Q.5** **Solve the following.** **12**
- (a) Explain flow control and error control.
- (b) Differentiate between circuit switching and packet switching

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1. Solve any two of the following. 12

(a) Explain the functions of session, presentation and application layer in detail.

(b) Describe different topologies in which a network is laid out Physically.

(c) Explain the different transmission impairments that affect data communications

2. Solve any two of the following. 12

(a) Differentiate between Manchester and differential Manchester encoding methods with relevant wave forms.

(b) Explain the PCM Technique of changing analog signal to digital signal with neat diagrams of PCM encoder & Decoder.

Contd..

- (c) With a neat diagram, explain FDM with respect to multiplexing and demultiplexing, and mention its applications.
3. **Solve the following.** 12
(a) Explain ASK, PSK in detail.
- (b) Design algorithm for Go-Back-N sender site and receiver site.
4. **Solve the following.** 12
(a) Describe Stop and Wait ARQ protocol.
(b) Explain, using example, how bit stuffing is used to preserve frame boundaries when transmitting binary data at Data Link Level of protocol stack.
5. **Solve any two of the following.** 12
(a) Describe block coding scheme in details
(b) Explain Checksum method of error detection with the help of example.
(c) Draw graph for data stream 01001110 using following coding scheme.
(i) RZ
(ii) Differential Manchester
(iii) AMI
(iv) NRZ-I

Government College of Engineering, Amravati
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Fourth Semester B. Tech. (Information Technology)

Summer- 2017

Course Code: ITU402

Course Name: Data Communication

Time: 2 Hrs. 30 Min.

Max. Marks: 60

Instructions to Candidate

- 1) All questions are compulsory.
- 2) Assume suitable data wherever necessary and clearly state the assumptions made.
- 3) Diagrams/sketches should be given wherever necessary.
- 4) Figures to the right indicate full marks.

1. Solve the following. 12

- a) What is the purpose of bridge?
- b) Distinguish between serial and parallel transmission.
- c) What do you mean by bit stuffing?
- d) Define flooding?
- e) How distortion and noise affect data communication.
- f) What are functions of applications layer?

Contd..

2. Solve.

- a) Explain the functions of network layer and transport layer in brief. 6
- b) Explain in details Digital to Analog conversion. 6

3. Solve any TWO

- a) Explain Frequency Division Multiplexing. 6
- b) Describe Block Coding technique. 6
- c) Describe the relative advantages and disadvantages of
i) Terrestrial links ii) Satellite links and iii) Optical fiber transmission. 6

4. Solve any TWO.

- a) Compare circuit switching with packet switching. 6
- b) What are the congestion control policies in
i) Data link ii) Network iii) Transport layer ? 6
- c) Describe algorithm for Stop-and-Wait ARQ protocol. 6

5. Solve the following.

- a) How checksum is calculated. Calculate the checksum for a text of 8 characters "Forouzan". 6
- b) Explain Polar line coding scheme. 6

Government College of Engineering, Amravati
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Fourth Semester B. Tech. (CS / IT)

Summer – 2016

Course Code: ITU402

Course Name: Data Communication

Time: 2 hr. 30min.

Max. Marks: 60

Instructions to Candidate

- 1) All questions are compulsory.
- 2) Assume suitable data wherever necessary and clearly state the assumptions made.
- 3) Diagrams/sketches should be given wherever necessary.
- 4) Figures to the right indicate full marks.

Q.1

Solve the following.

12

- (a) Distinguish between time domain and frequency domain representation of a signal.
- (b) What are the factors responsible for attenuation in case of terrestrial microwave communication?
- (c) What is quantization error? How can it be reduced?
- (d) How the inefficiency of Stop-and-Wait protocol is overcome in sliding window protocol?
- (e) How does Manchester encoding differ from differential Manchester encoding?

- (f) The power of a signal is 10 mW and the power of the noise is $1 \mu\text{W}$; what are the values of SNR and SNRdB?

Solve any two of the following.

Q.2

12

- (a) Describe how Analog to Analog conversion takes place.
- (b) Explain the functions of network layer and transport layer in brief.
- (c) Explain Frequency Division Multiplexing.

Q.3

12

Solve the following.

- (a) How Cyclic Redundancy Check detects error in message transmission? Explain with suitable example.
- (b) Design Sender-site and Receiver-site algorithm for Stop-and-Wait ARQ Protocol.

Q.4

12

Solve the following.

- (a) Compare and contrast Go-Back-N ARQ with Selective-Repeat ARQ.
- (b) Explain circuit switching technique with its key advantages and disadvantages.

Q.5

12

Solve any two of the following.

- (a) Describe following networking devices:
- (i) Bridge
 - (ii) Router
 - (iii) gateway

- (b) A sender needs to send the four data items 0x3456, 0xABCC, 0x02BC, 0xEEEE. Find
- (i) checksum at the sender site.
 - (ii) Checksum at receiver site if the second data item is changed to 0xABCE
 - (iii) Checksum at receiver site if second data item is changed to 0xABCE and third item is changed to 0x02BA
- (c) Describe NRZ coding system? Draw graph for NRZ-I scheme using each of following data stream.
- (i) 11111111
 - (ii) 00000000
 - (iii) 00110011
 - (iv) 01010101